

National Park Service
U.S. Department of the Interior

Hovenweep National Monument
Colorado · Utah



GENERAL MANAGEMENT PLAN ENVIRONMENTAL ASSESSMENT

Cover photo: Hovenweep Castle

General Management Plan / Environmental Assessment
Hovenweep National Monument
Montezuma County, Colorado, and San Juan County, Utah

Hovenweep National Monument was established by presidential proclamation on March 2, 1923 (Presidential Proclamation 1654 42 Stat. 2299). There is currently no approved general management plan for the monument. The purpose of the general management plan is to establish a comprehensive vision of the monument's purpose, significance, and resource goals. The plan will also define the management strategies for protecting the monument's resources, providing for public understanding and enjoyment, ensuring organizational effectiveness, and promoting partnership opportunities that will support and complement all aspects of park management. The plan will help monument staff guide programs and set priorities for resource stewardship, visitor use and experience, partnerships, facilities, and operations at Hovenweep National Monument.

The National Park Service developed a draft general management plan and environmental assessment for Hovenweep in the mid-1980s and released a draft in 1988. The draft plan proposed a resource protection zone encompassing Bureau of Land Management lands with nationally significant cultural resources surrounding the Hovenweep units and a cooperative management strategy to protect these resources. The 1988 draft plan was never finalized.

This document examines two alternatives for managing Hovenweep National Monument for the next 15 to 20 years. It also analyzes the impacts of implementing each of the alternatives. The "no-action" alternative, alternative A, consists of the existing national monument management strategy and trends and serves as a basis for comparison in evaluating the other alternative. The concept for management under alternative B would focus on preserving the resources and the remote and primitive character of the monument. Alternative B is the National Park Service preferred alternative.

The key effects of implementing the no-action alternative (A) would be some minor adverse impacts on archeological resources, visitor experience, and visitor access. The key effects of implementing alternative B would be minor to moderate beneficial impacts on the visitor experience, minor to moderate beneficial impacts on visitor access, moderate beneficial impacts on natural and cultural resources, and moderate beneficial impacts on National Park Service operations.

This *General Management Plan / Environmental Assessment* has been distributed to other agencies and interested organizations and individuals for their review and comment. The public comment period for this document will last for 30 days. Readers are encouraged to submit comments on this plan at <http://parkplanning.nps.gov>. You may also send written comments to Tom Thomas, National Park Service, Denver Service Center – PSD, PO Box 25287, Denver, CO 80225, or call Superintendent Coralee Hays at 435-692-1234. Please note that National Park Service practice is to make comments, including names and addresses of respondents, available for public review; see "How to Comment on this Plan" for further information.

HOW TO COMMENT ON THIS PLAN

Comments on this *General Management Plan / Environmental Assessment* are welcome and will be accepted during the 30-day public review and comment period. During the comment period, comments may be submitted using several methods as noted below.

Online: <http://parkplanning.nps.gov/hove>

We prefer that readers submit comments online through the park planning website identified above, so the comments become incorporated into the National Park Service Planning, Environment, and Public Comment system. An electronic public comment form is provided through this website.

Mail: Hovenweep National Monument General Management Plan
National Park Service
Denver Service Center – PDS
PO Box 25287
Denver, CO 80225

or

Hovenweep National Monument
McElmo Route
Cortez, CO 81321

Hand delivery: at public meetings to be announced in the media following the release of this plan.

Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you may ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

SUMMARY

Hovenweep National Monument was established by presidential proclamation on March 2, 1923 (Presidential Proclamation 1654 42 Stat. 2299). The monument consists of six detached units in southeastern Utah and southwestern Colorado that protect 13th century pueblo standing towers and villages at canyon head locations. One of these units, Goodman Point, was the first archeological site set aside by the federal government in 1899 and is one of the largest 13th century village sites in the San Juan River basin.

The National Park Service developed a draft general management plan and environmental assessment for Hovenweep in the mid-1980s, releasing a draft in 1988. The draft plan proposed a resource protection zone, encompassing Bureau of Land Management lands with nationally significant cultural resources surrounding the Hovenweep units and a cooperative management strategy to protect these resources. The 1988 draft plan was never finalized.

Much has occurred since 1988 and the development of that plan. A new plan will meet the following needs:

- Clearly define resource conditions and visitor experiences to be achieved in Hovenweep National Monument.
- Provide a framework for National Park Service managers to use when making decisions about how to best protect national monument resources, how to provide a diverse range of visitor opportunities, how to manage visitor use, and what kinds of facilities, if any, to develop in the national monument.
- Ensure that this foundation for decision making has been developed in consultation with interested stakeholders and adopted by National Park Service leadership after an adequate analysis of the benefits, impacts, and economic costs of alternative courses of action.

This general management plan / environmental assessment presents two alternatives, including the National Park Service preferred alternative, for future management of Hovenweep National Monument. The alternatives, which are based on the national monument's purpose, significance, and special mandates, present different ways to manage resources and visitor use and improve facilities and infrastructure at the national monument. Alternative A, the no-action alternative, is the continuation of current management, and alternative B is the preferred alternative.

Additional actions and alternatives were considered; however, they were dismissed from further analysis. These dismissed actions and alternatives are presented, along with the rationale for dismissing them, in "Chapter 2: Alternatives, Including the Preferred Alternative."

ALTERNATIVE A: THE NO-ACTION ALTERNATIVE (CONTINUE CURRENT MANAGEMENT)

The no-action alternative consists of a continuation of existing management and trends at Hovenweep National Monument and provides a baseline for comparison in evaluating the changes and impacts of the other alternative. Under the no-action alternative, the National Park Service would continue to manage the national monument as it is currently being managed. Existing operations and visitor facilities would remain in place. No new construction would be authorized. Efforts would continue to protect and preserve significant cultural and natural resources. Natural ecological processes would be allowed to occur, and restoration programs would be initiated where necessary.

The important effects of continuing existing management conditions and trends would include potential adverse impacts on the

SUMMARY

visitor experience, visitor access, and archeological resources.

ALTERNATIVE B – THE PREFERRED ALTERNATIVE

Management under alternative B would focus on preserving the resources and the remote and primitive character of Hovenweep National Monument. Resource preservation efforts would be enhanced by limited, conservation-oriented archeological research that would provide park staff and other National Park Service professionals with a better understanding of the monument's resource base and would help guide future resource protection.

In addition to informing resource management decisions, the conservation archeology under this alternative would also answer many questions about the lives of the ancestral people. These questions involve such topics as population densities, cultural interactions, migration patterns, the extent of trade networks, and the long-term environmental impacts of their development of the region. Visitors to Hovenweep have raised many questions relating to these topics. Contemporary Pueblo tribes also have expressed interest in establishing tangible evidence of their ancestral migrations and oral histories. Answers to these questions would greatly enrich the visitor experience at the monument.

Monument staff would also initiate the development of regional visitor use and education plans and for preservation programs in partnership with the Bureau of Land Management (Anasazi Heritage Center, Monticello Field Office, Canyon of the Ancients National Monument), U.S. Forest Service, Edge of the Cedars State Park, Crow Canyon Archaeological Center, and other state, local, and private agencies and organizations. The plans and programs would interpret the lives of the ancestral Pueblo people in a broader regional context and inform visitors of the

important role they can play in resource protection and preservation.

Protection of important vistas from and within the monument units would contribute to preserving the monument's remote and primitive character. Unobstructed natural views are critical because they contribute to feelings of remoteness, solitude, and timelessness—fundamental qualities of the Hovenweep experience.

Regional patterns of development over the past decade indicate that there is a probability that future land use will introduce modern elements into the scenery surrounding the Hovenweep units. The National Park Service would spearhead a partnership of federal, state, and local governmental bodies and organizations; monument neighbors; and local communities to develop a protection strategy for all critical views, such as those from the Square Tower and Goodman Point units. This protection strategy would identify and prioritize all critical and important views, establish protective guidelines, and determine the appropriate mechanisms to implement those guidelines.

Additional development under this alternative would be minimal, in keeping with the overall objective of maintaining the monument's primitive qualities. A new maintenance facility would be constructed at the Square Tower unit to replace the existing maintenance shed. Some small-scale improvements could be made to parking areas, trails, and informational signs. Vault toilets would be installed at key locations to replace existing pit toilets.

This alternative better meets the monument's purposes, needs, and objectives compared with the no-action alternative by providing additional protection for the cultural and natural resources of the monument, expanding the range of visitor experiences, and enhancing the park's outreach and partnership programs. The important effects of implementing alternative B would include potentially beneficial impacts on the visitor experience, interpretive programs, cultural

and natural resources, and monument operations.

THE NEXT STEPS

After the distribution of the general management, plan / environmental assessment there will be a 30-day public review and comment period. Thereafter, the National Park Service planning team will evaluate review comments from other federal agencies, tribes, organizations, businesses, and individ-

uals, and will incorporate changes as appropriate. After distribution of the approved plan, the National Park Service regional director will sign a “Finding of No Significant Impact,” which documents the National Park Service’s selection of an alternative for implementation. After the “Finding of No Significant Impact” has been signed, the plan can be implemented after a 30-day waiting period.

CONTENTS

CHAPTER 1: INTRODUCTION

A Guide to this Document 3

Background 4

- Brief Description of the National Monument 4
- Purpose of the Plan 4
- Need for the Plan 5
- Appropriate Use 5
- The Next Steps 6
- Implementation of the Plan 6

Foundation For Planning and Management 8

- Purpose and Significance 8
- Fundamental Resources and Values 9
- Primary Interpretive Themes 9
- Service-wide Mandates and Policies 10

Relationship of Other Planning Efforts to This Plan 19

- Canyons of the Ancients National Monument Resource Management Plan 19
- Resource Management Plan BLM Monticello Field Office 19
- Statewide comprehensive Outdoor Recreation Plans – Utah and Colorado 20
- McPhee Reservoir Recreation Plan (Montezuma County, Colorado) 20
- Vanishing Treasures Initiative 20

Planning Issues and Concerns 21

- Cultural Resources 21
- Natural Resources 21
- Visitor Experience 21
- Interpretation and Education 22
- Monument Operations 22
- Cooperative Management 22

Impact Topics—Resources and Values at Stake in the Planning Process 23

- Impact Topics To Be Considered 23
- Impact Topics Dismissed from Further Consideration 27
- Boundary Adjustments 32

CHAPTER 2: ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE

Introduction 37

- Building Blocks – Management Zones and Alternatives 37
- Implementing the Preferred Alternative 38
- Management Zone Descriptions 38

Alternative A: No Action — Continue Current Management 44

- Resource Condition 44
- Visitor Experience 44
- Facilities and Development 44
- Management Zones 44
- Estimated Costs 44

Alternative B: Preferred Alternative 55

- Resource Preservation 55
- Visitor Experience 58
- Facilities and Development 59

CONTENTS

Park Units and Management Zones	60
Boundary Adjustment	61
Estimated Costs	61
Agency Preferred Alternative	62
Actions Common to Both Alternatives	73
User Capacity	74
Introduction	74
Indicators and Standards	75
Mitigative Measures for the Alternatives	78
Cultural Resources	78
Natural Resources	79
Visitor Safety and Experiences	80
Noise Abatement	80
Viewsheds / Soundscapes / Night Skies	80
Sustainable Design and Aesthetics	80
Environmentally Preferable Alternative	82
Alternatives and Actions Considered but Dismissed from Further Consideration	83
Future Studies Needed	84
Summary and Comparison Tables	85
CHAPTER 3: AFFECTED ENVIRONMENT	
Introduction	91
General Description	92
Monument Units	92
Climate	93
Topography	93
Cultural Resources	94
Cultural Context	94
Previous Archeological Investigations	97
Cultural Landscapes	98
Ethnographic Resources	99
Prehistoric Structures	99
Natural Resources	101
Soils	101
Biological Soil Crusts	101
Vegetation	101
Wildlife	103
Special Status Species	103
Viewsheds	103
Night Skies	104
Soundscapes	104
Visitor Use and Understanding	106
Visitor Use	106
Visitor Understanding	107
Visitor Experience Opportunities	107
Visitor Safety and Access	107
Socioeconomic Environment	109
Social Values	109

Economic Values 109

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

Introduction 113

Cumulative Impact Analysis 114

Past Actions 114
 Present Actions 114
 Future Actions 115
 Impairment of National Monument Resources 115
 Unacceptable Impacts 116

Impact Analysis Methodology 117

Duration of Impacts 117
 Section 106 of the National Historic Preservation Act and Impacts on Cultural Resources 117

Cultural Resources Impact Analysis 119

Prehistoric Structures 119
 Archeological Resources 121
 Cultural Landscapes 123
 Ethnographic Resources 126

Natural Resources Impact Analysis 129

Soils 129
 Vegetation 131
 Wildlife 132
 Special Status Species 134
 Viewsheds 136
 Night Skies 137
 Soundscapes 138

Visitor Use and Understanding Impact Analysis 141

Methodology 141
 Impacts from the No-action Alternative 141
 Impacts from the Preferred Alternative 142

Socioeconomic Environment Impact Analysis 143

Methodology 143
 Impacts from the No-action Alternative 143
 Impacts from the Preferred Alternative 144

Monument Operations Impact Analysis 145

Methodology 145
 Impacts from the No-Action Alternative 145
 Impacts from the Preferred Alternative 146

Other Impacts 147

Unavoidable Major Adverse Impacts 147
 Irreversible and Irretrievable Commitments of Resources 147
 Relationships Between Short-Term Uses of the Environment and Long-Term Productivity 147

CHAPTER 5: CONSULTATION AND COORDINATION

Public and Agency Involvement 151

Public Meetings and Newsletters 151
 Section 7 Consultation (Endangered Species Act) 151
 Native American Consultation 152
 Section 106 Consultations 152

CONTENTS

APPENDIXES, REFERENCES, PREPARERS AND CONSULTANTS

***Appendix A: Cooperative Agreements For Hovenweep National Monument and the Southeast Utah Group* 155**

***Appendix B: List of Classified Structures* 156**

***Appendix C: Consultation Letters* 158**

***Appendix D: Determination of Impairment* 165**

***References* 169**

***Preparers and Consultants* 174**

Preparers 174

Consultants 174

***Index* 175**

TABLES

Table 1: Servicewide Mandates and Policies Pertaining to Hovenweep National Monument 12

Table 2: Federally Listed Species that May Inhabit the Vicinity of the Monument 26

Table 3: Management Zones 40

Table 4: Estimated Costs of Alternative A 44

Table 5: Viewshed Protection Tools 57

Table 6: Estimated Costs of Alternative B 61

Table 7: Indicators and Standards 77

Table 8: Summary and Comparison of Alternatives 85

Table 9: Summary and Comparison of Key Environmental Consequences from Alternatives 86

Table 10: Soils 102

Table 11: Sound Levels (dBA) for the Three Primary Groups of Land Cover Types 105

Table 12: Annual Monument Visitation, 1993–2007 107

Table 13: Visitation and Spending by Visitor Segments (2006 data) 110

Table 14: Economic Impacts of Visitor Spending by Sector (2006) 110

FIGURES

Figure 1: Region	17
Figure 2: Square Tower Unit, No-action Alternative	45
Figure 3: Cajon Unit, No-action Alternative	47
Figure 4: Holly and Horseshoe/Hackberry Units, No-action Alternative	49
Figure 5: Cutthroat Castle Unit, No-action Alternative	51
Figure 6: Goodman Point Unit, No-action Alternative	53
Figure 7: Square Tower Unit, Preferred Alternative	63
Figure 8: Cajon Unit, Preferred Alternative	65
Figure 9: Holly and Horseshoe/Hackberry Units, Preferred Alternative	67
Figure 10: Cutthroat Castle Unit, Preferred Alternative	69
Figure 11: Goodman Point Unit, Preferred Alternative	71

INTRODUCTION

1



A GUIDE TO THIS DOCUMENT

This general management plan / environmental assessment is organized in accordance with the Council on Environmental Quality's implementing regulations for the National Environmental Policy Act, National Park Service (NPS) *Management Policies 2006*, park planning program standards, and Director's Order (DO) 12: *Conservation Planning, Environmental Impact Analysis, and Decision-Making*.

Chapter 1: Introduction sets the framework for the entire document. It describes why the plan is being prepared and what needs it must address. It gives guidance for the alternatives that are being considered; this guidance includes the national monument's legislated mission, its purpose, the significance of its resources, special mandates and administrative commitments, servicewide mandates and policies, and other planning efforts in the area.

The chapter also details the planning opportunities and issues that were raised during public scoping meetings and initial planning team efforts; the alternatives in the next chapter address these issues and concerns to varying degrees. The first chapter concludes with a statement of the scope of the environmental impact analysis—specifically, what impact topics were or were not analyzed in detail.

Chapter 2: Alternatives, Including the Preferred Alternative, begins by describing the management zones that will be used to manage the national monument in the future. Alternative A, the no-action alternative, and

alternative B, the preferred alternative, are presented. Mitigating measures proposed to minimize or eliminate the adverse impacts of some proposed actions are described just before the discussion of future studies or implementation plans that will be needed. The evaluation of the environmentally preferable alternative is followed by tables summarizing the alternative actions and the environmental consequences of implementing those actions. The chapter concludes with a discussion of alternatives or actions that were dismissed from detailed evaluation.

Chapter 3: Affected Environment, describes the areas and resources that would be affected by implementing actions in the various alternatives—cultural resources, natural resources, visitor use and understanding, and the socioeconomic environment.

Chapter 4: Environmental Consequences, analyzes the impacts on resources described in the "Affected Environment" chapter that would result from implementing the alternatives. Methods used for assessing the impacts (intensity, type, and duration of impacts) are outlined at the beginning of the chapter.

Chapter 5: Consultation and Coordination, describes the history of public and agency coordination during the planning effort and any future compliance requirements. It also lists agencies and organizations that will receive copies of the document.

The back of the document contains appendixes, selected references, a list of the planning team and consultants, and the index.

BACKGROUND

This general management plan / environmental assessment presents and analyzes two alternative future directions for the management and use of Hovenweep National Monument. Alternative B is the NPS preferred alternative. The potential impacts of both alternatives have been identified and assessed.

General management plans are intended to be long-term documents that establish and articulate a management philosophy and framework for decision making and problem solving in the parks. General management plans usually provide guidance for a 15- to 20-year period.

BRIEF DESCRIPTION OF THE NATIONAL MONUMENT

Hovenweep National Monument consists of six detached land units in southeastern Utah and southwestern Colorado, established to protect 13th century ancestral Pueblo standing towers and villages at canyon head locations. The units range in size from 14 to 400 acres; one unit is surrounded by the Navajo Nation. The Hovenweep structures are the best preserved and protected and most visually striking and accessible examples of 13th century pueblo architecture and community locations within the San Juan River basin. The Goodman Point unit was the first archeological site set aside by the federal government in 1889 and is one of the largest 13th century ancestral Pueblo villages in the San Juan River basin. The monument also contains examples of ancient astronomical calendars that mark important seasonal events using architecture, rock art, and sunlight.

PURPOSE OF THE PLAN

The approved general management plan will be the basic document for managing Hovenweep National Monument for the next

15 to 20 years. The purposes of this plan are as follows:

- Confirm the purpose, significance, and special mandates of Hovenweep National Monument.
- Clearly define resource conditions and visitor uses and experiences to be achieved in the national monument.
- Provide a framework for national monument managers to use when making decisions about how best to protect the resources; how to offer quality visitor uses and experiences; how to manage visitor use; and what kinds of facilities, if any, to develop in or near the national monument.
- Ensure that this foundation for decision making has been developed in consultation with interested stakeholders and adopted by the NPS leadership after an adequate analysis of the benefits, impacts, and economic costs of alternative courses of action.

Legislation establishing the National Park Service as an agency and governing its management provides the fundamental direction for the administration of Hovenweep National Monument (and other units and programs of the national park system). This general management plan will build on these laws and the legislation that established Hovenweep National Monument to provide a vision for the future.

The “Servicewide Mandates and Policies” section calls readers’ attention to topics that are important to understanding the management direction at the national monument. Table 1 summarizes the mandates and policies and includes conditions toward which management is striving, regardless of which alternative is selected. The alternatives in this plan address the desired future conditions that are not mandated by law and policy and

must be determined through a planning process.

This general management plan does not include descriptions of how particular programs or projects should be prioritized or implemented. Those decisions will be addressed in future more-detailed planning efforts. All future plans will tier off the approved general management plan and will be based on the goals, future conditions, and appropriate types of activities established in the approved general management plan.

NEED FOR THE PLAN

This new plan for Hovenweep National Monument is needed because the monument has never had a general management plan. The last comprehensive planning effort for the national monument was conducted in 1988, but was never finalized. Much has occurred since then—the population of the northern San Juan basin has grown, residential and commercial development has expanded into rural areas, recreational use has grown and diversified, there is increased demand for the region’s oil and gas resources, and adjacent Canyons of the Ancients National Monument was established in 2000. Each of these changes has implications for how visitors enjoy and use the national monument and the facilities needed to support those uses, how resources are managed, and how the National Park Service manages its operations.

A general management plan also is needed to meet the requirements of the National Parks and Recreation Act of 1978 and NPS policy, which mandate the development of a general management plan for each unit in the national park system.

APPROPRIATE USE

Sections 1.4 and 1.5 of *NPS Management Policies 2006* direct that the National Park Service must ensure that uses that are allowed within a unit of the national park system

would not cause impairment of, or unacceptable impacts on, park resources and values. A new form of park use may be allowed within a park only after a determination has been made in the professional judgment of the park manager that it will not result in unacceptable impacts.

Section 8.1.2 of *NPS Management Policies 2006* provides evaluation factors for determining appropriate uses. All proposals for park uses are evaluated for

- consistency with applicable laws, executive orders, regulations, and policies;
- consistency with existing plans for public use and resource management;
- actual and potential effects on park resources and values; and
- whether the public interest will be served.

Park managers must continually monitor all park uses to prevent unanticipated and unacceptable impacts. If unanticipated and unacceptable impacts emerge, the park manager must engage in a thoughtful, deliberate process to further manage or constrain the use, or discontinue it.

Further, section 8.2 of *NPS Management Policies 2006* states: “To provide for enjoyment of the parks, the National Park Service will encourage visitor use activities that

- are appropriate to the purpose for which the park was established; and
- are inspirational, educational, or healthful, and otherwise appropriate to the park environment; and
- will foster an understanding of and appreciation for park resources and values, or will promote enjoyment through a direct associations with, interaction with, or relation to park resources; and

- can be sustained without causing unacceptable impacts to park resources and values.”

The primary visitor uses that are currently available or will be provided upon implementation of this general management plan at Hovenweep National Monument include viewing and learning about the monument ruins at the visitor center and via the existing interpretive trails to the ruins, and learning about the culture and lives of the ancestral Pueblo people. These uses meet the criteria outlined in section 8.1.2 and section 8.2 of the *NPS Management Policies 2006*.

Regarding section 8.1.2, all the management actions outlined in the alternatives presented in chapter 2 of this document, including the preferred alternative, are consistent with applicable laws, executive orders, regulations, and policies of the National Park Service. Secondly, this general management plan proposes to establish future public use and resource management direction for the monument that is compatible with or updates existing planning documents. Finally, the effects of the proposed alternatives and whether the public interest will be served are evaluated in the impact analyses that are presented by impact topic throughout Chapter 4, “Environmental Consequences.” Additionally, the alternatives proposed in this general management plan were determined to serve the public interest by identifying public concerns during scoping and throughout the planning process, and by ensuring preservation of the monument resources unimpaired for future generations.

As directed by section 8.2, the visitor uses outlined in the alternatives presented in chapter 2 and evaluated within this general management plan are appropriate to the purpose for which the monument was established, are inspirational and educational, foster an understanding of and appreciation for park resources and values, and can be sustained without causing unacceptable impacts to park resources and values. Therefore, all the visitor activities proposed

within this general management plan are appropriate uses for Hovenweep National Monument.

THE NEXT STEPS

After the distribution of the general management plan / environmental assessment there will be a 30-day public review and comment period. Thereafter, the NPS planning team will evaluate review comments from other federal agencies, tribes, organizations, businesses, and individuals, and will incorporate changes as appropriate. After distribution of the approved plan, the NPS regional director will sign a “Finding of No Significant Impact” (FONSI), which documents the National Park Service’s selection of an alternative for implementation. After the “Finding of No Significant Impact” has been signed, the plan can be implemented after a 30-day waiting period.

IMPLEMENTATION OF THE PLAN

The implementation of the approved plan will depend on future funding. The approval of a plan does not guarantee that the funding and staffing needed to implement the plan will be forthcoming. Full implementation of the approved plan could take place many years in the future.

Implementation of the approved plan also could be affected by other factors. After the general management plan has been approved, additional feasibility studies and more detailed planning and environmental documentation would be completed, as required, before any proposed actions could be carried out.

As part of the planning process, the following consultations would occur:

- Appropriate federal and state agencies would be consulted about actions that could affect threatened or endangered species.

- The state historic preservation offices and the Navajo Tribal Historic Preservation Officer (Cajon unit) would be consulted about actions that could adversely affect cultural resources.
- The National Park Service would consult with affiliated tribal governments about sacred and other sites of interest to the tribes.

FOUNDATION FOR PLANNING AND MANAGEMENT

PURPOSE AND SIGNIFICANCE

Purpose

Purpose statements are based on Hovenweep National Monument’s legislation and legislative history and NPS policies. The statements reaffirm the reasons for which the national monument was set aside as a unit of the national park system and provide the foundation for the area’s management and use.

These statements help neighbors, visitors, cooperating agencies, and other users understand the framework in which park managers make decisions. The following purpose statements have been refined over time and are based on the monument’s establishing legislation as well as laws and policies governing management of all national park system units.

President Warren G. Harding established Hovenweep National Monument by presidential proclamation in 1923. President Harding proclaimed that

“The public good would be promoted by reserving these prehistoric remains as a National Monument with as much land as may be necessary for the proper protection thereof. . .”

The president directed that the National Park Service

“Shall have the supervision, management, and control of this Monument, as provided in the act of Congress entitled, “An Act to establish a National Park Service. . .”

In keeping with this presidential proclamation, the purposes of Hovenweep National Monument are to:

- Protect extraordinary examples of prehistoric architecture and the setting in which they are located.
- Protect other features of geological, historical, and scientific interest.

- Provide opportunities for visitor appreciation and education that leave monument resources unimpaired.

Significance of the Monument

Significance statements build on the monument’s purpose and clearly state why, within a national context, the monument’s resources and values are important enough to warrant the designation as a unit of the national park system. These statements identify the resources and values that are central to managing the area and express the importance of the area to our natural and cultural heritage. The following are the significance statements for Hovenweep National Monument:

- The park contains a high concentration of the best-preserved freestanding towers and related structures in the American Southwest. Located in several canyon head settlements, these remains are excellent representations of ancestral Pueblo communities existing on the Great Sage Plain¹ during the late Pueblo III period.
- Hovenweep lies in an area that is significant to many cultural groups including Pueblo, Ute, Navajo, and Anglo communities.
- Hovenweep’s well-preserved archeological sites comprise cultural landscapes that offer exceptional opportunities for research into ancestral Pueblo community life including the final decades of occupation and depopulation of the region.
- The park’s extensive materials collection provides important evidence of the ancestral Pueblo culture as well as insights

¹ The Great Sage Plain, a vast plateau cut by numerous canyons, stretches from Cortez, Colorado northwestward into Utah. A productive agricultural region today, the Great Sage Plain displays numerous ruins of the ancestral Puebloan culture.

into the ways the people adapted to this demanding environment.

- The park represents an intact remnant of the Great Sage Plain ecosystem. This harsh desert environment presents survival challenges for both human inhabitants and the natural flora and fauna. Plant and animal species characteristic of this ecosystem are found in most units of Hovenweep.
- Hovenweep’s perceived remoteness and uninterrupted horizons lend a sense of discovery to visitors’ experiences. The shallow canyons, riparian systems, spring alcoves, and structural remains enable visitors to more easily envision the life of ancestral Pueblo communities and their relationship to the natural environment.

FUNDAMENTAL RESOURCES AND VALUES

Fundamental resources and values are systems, processes, features, visitor experiences, stories, and scenes that deserve primary consideration in planning and management because they are critical to maintaining the national monument’s purpose and significance. The term “fundamental resources” generally refers to those resources within the monument boundary. Fundamental values are those that, like views and vistas, transcend the monument’s boundaries but still contribute to visitor understanding and appreciation of the monument. Fundamental resources and values are subject to periodic reviews and updates based on new information and changing conditions. The fundamental resources and values listed below are the most important of the monument’s resources and values, all of which were considered during the planning effort.

Cultural Resources

- tower structures
- archeological sites
- kivas
- lithic scatters

- park collections

Cultural Landscapes

- canyon head communities
- village sites

Natural Setting

- canyons
- plateaus
- plains
- riparian systems – springs and seeps
- native plant and animal species
- views and vistas from within the park boundary
- night skies
- natural soundscapes

PRIMARY INTERPRETIVE THEMES

Interpretive themes are ideas, concepts, or stories that are central to the monument’s purpose, significance, identity, and visitor experience. The primary interpretive themes define concepts that every visitor should have the opportunity to learn. Primary themes also provide the framework for the monument’s interpretation and educational programs, influence the visitor experience, and provide direction for planners and designers of the monument’s exhibits, publications, and audiovisual programs. Following are the primary interpretive themes for Hovenweep National Monument:

- Oral traditions of the modern day Pueblo people say that Hovenweep is their ancestral village and a stepping-stone in their journey to the sacred center place. The park’s preserved cultural and natural landscape gives physical form to oral traditions of living Pueblo peoples’ creation and migration stories. Since the time of migration, the Hovenweep area has subsequently been a home place to many other people including Utes, Navajos, and eventually Anglo settlers.
- Standing architecture still present at Hovenweep provides tangible remains of a

once vibrant community. From these remains, we glimpse ancestral Pueblo community life, traditions, and challenges. Reflections on this ancient culture in this undisturbed setting provide an opportunity for modern visitors to relate their lives to those of earlier inhabitants.

- Ancestral Pueblo society at Hovenweep flourished. Evidence of their architectural and intellectual achievements is seen in the buildings, rock art, and celestial markers that remain today. These elements indicate a culture that was not just surviving but thriving.
- The Great Sage Plain supports the same wildlife and resources today that past communities relied upon for shelter, food, and clothing. Plants, animals, and people have adapted and thrived on these mesa tops, shallow canyons, riparian systems, and spring alcoves for thousands of years.
- The human story at Hovenweep has a timeless quality that provokes questions about motivations and worldviews of the ancestral Pueblo people. We must preserve and study these clues to the past to better understand who they were and how they lived.

SERVICEWIDE MANDATES AND POLICIES

This section identifies what must be done at Hovenweep National Monument to comply with federal laws and NPS policies. Many management directives are specified in laws and policies guiding the National Park Service and are therefore not subject to alternative approaches. For example, there are laws and policies about managing environmental quality, such as the Clean Air Act, the Endangered Species Act, and Executive Order (EO) 11990: “Protection of Wetlands”; laws governing the preservation of cultural resources, such as the National Historic Preservation Act; and laws about providing public services, such as the Architectural Barriers Act Accessibility Standards—to name only a few. In other words, a general

management plan is not needed to decide, for instance, that it is appropriate to protect endangered species, control nonnative species, protect archeological sites, conserve artifacts, or provide access for people with disabilities. Laws and policies already have decided those and many other things for us. Although attaining some of the conditions set forth in these laws and policies might have been temporarily deferred in the national monument because of funding or staffing limitations, the National Park Service will continue to strive to implement these requirements with or without a new general management plan.

Some of these laws and executive orders are applicable solely or primarily to units of the national park system. These include the 1916 Organic Act that created the National Park Service, the General Authorities Act of 1970 (the National Parks Omnibus Management Act), and the March 27, 1978, Redwood Amendment to this act, relating to the management of the national park system. Other laws and executive orders, such as the Endangered Species Act, the National Historic Preservation Act, and Executive Order 11990 addressing the protection of wetlands have much broader application.

The NPS Organic Act (16 *United States Code* [USC] § 1) provides the fundamental management direction for all units of the national park system. It states that the purpose of the National Park Service is to

P]romote and regulate the use of the Federal areas known as national parks, monuments, and reservations. . . by such means and measure as conform to the fundamental purpose of said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

The National Park System General Authorities Act (16 USC § 1a-1 et seq.) affirms that while all national park system units remain “distinct in character,” they are “united through their interrelated purposes and resources into one national park system as cumulative expressions of a single national heritage.” The act makes it clear that the NPS Organic Act and other protective mandates apply equally to all units of the system.

Further, amendments state that NPS management of park units should not “derogate . . . the purposes and values for which these various areas have been established.”

The plan must identify the appropriate activities and levels of use throughout the monument. Under the 1978 National Parks and Recreation Act (Public Law 95-625), the National Park

Service is required to address the issue of user capacity in its general management plans. The National Park Service also has established policies for all units under its stewardship. These are identified and explained in the National Park Service guidance manual entitled *NPS Management Policies 2006*. The preferred alternative (alternative B) considered in this document would incorporate and comply with the provisions of these mandates and policies.

To fully understand the implications of an alternative, it is important to combine the servicewide mandates and policies with the management actions described in the alternative.

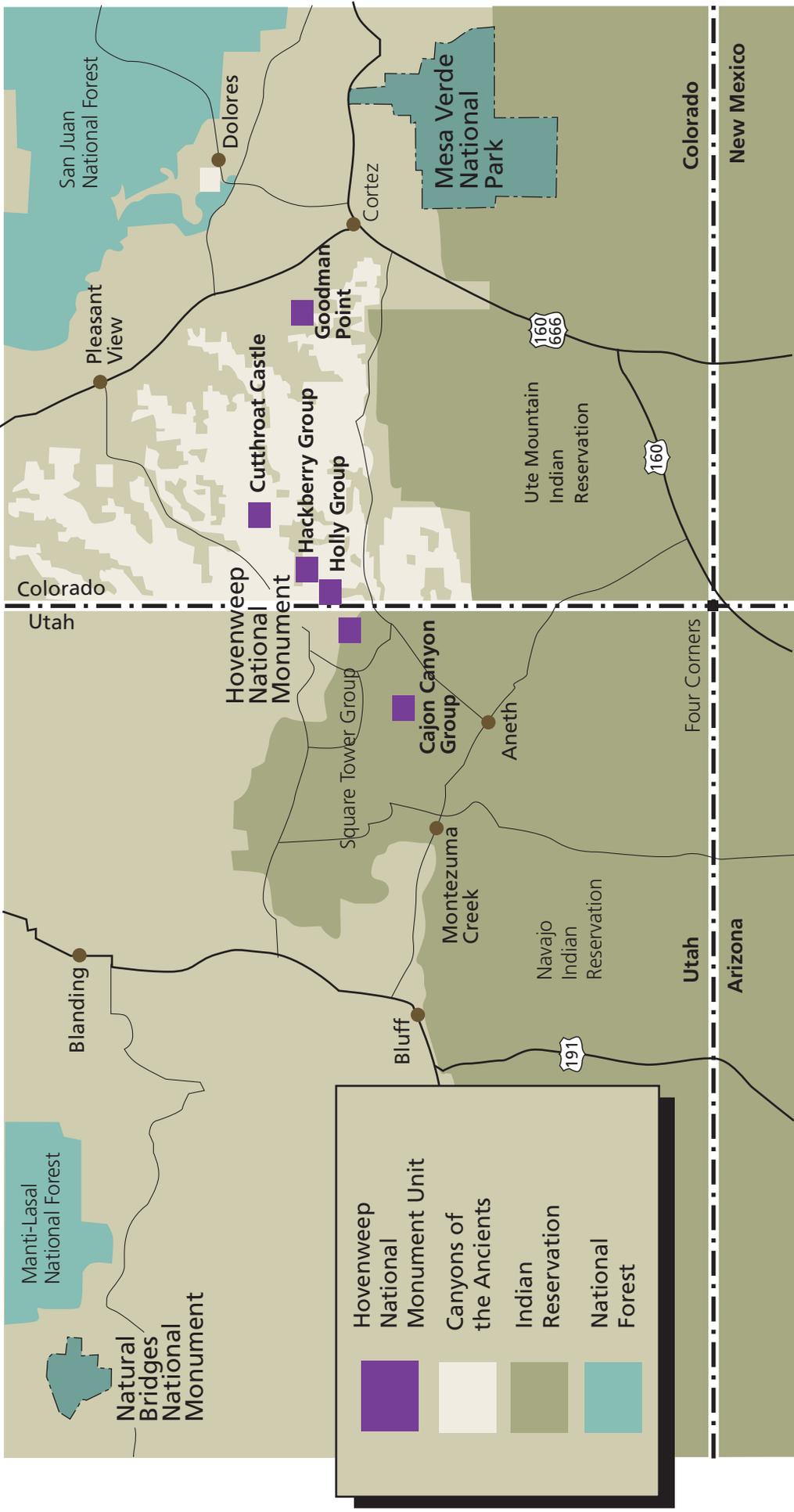
The servicewide mandates and policies governing management at Hovenweep are presented in table 1.

Table 1: Servicewide Mandates and Policies Pertaining to Hovenweep National Monument

TOPIC	Current Laws and Policies Require That the Following Conditions Be Achieved at Hovenweep National Monument
Relations with Private and Public Organizations, Owners of Adjacent Land, and Governmental Agencies	<p>The national monument is managed as part of a greater ecological, social, economic, and cultural system.</p> <p>Good relations are maintained with adjacent landowners, surrounding communities, and private and public groups that affect, and are affected by, the monument. The monument is managed proactively to resolve applicable external issues and concerns and ensure that park values are not compromised.</p> <p>Because Hovenweep National Monument is an integral part of a larger regional environment, the National Park Service works cooperatively with others to anticipate, avoid, and resolve potential conflicts, protect Hovenweep’s resources, and address mutual interests in the quality of life for community residents. Regional cooperation involves federal, state, and local agencies, American Indian tribes and pueblos, neighboring landowners, and all other concerned parties.</p> <p>Sources: <i>NPS Management Policies 2006</i>; DO-50 and RM-50, “Safety and Health”</p>
Natural Resources	
Air Quality	<p>Air quality in the national monument meets national ambient air quality standards for specified pollutants. Hovenweep’s air quality is maintained or enhanced with no significant deterioration.</p> <p>Sources: Clean Air Act, NPS Organic Act, <i>NPS Management Policies 2006</i>; NPS-77, “Natural Resources Management Guidelines”</p>
Ecosystem Management	<p>Hovenweep National Monument is managed holistically, as part of a greater ecological, social, economic, and cultural system.</p> <p>Source: <i>NPS Management Policies 2006</i></p>
Nonnative Species	<p>The management of populations of nonnative plant and animal species, up to and including eradication, are undertaken wherever such species threaten Hovenweep’s resources or public health and when control is prudent and feasible.</p> <p>Sources: <i>NPS Management Policies 2006</i>; EO 13112, “Invasive Species”; NPS-77, “Natural Resources Management Guidelines”</p>
Fire Management	<p>Hovenweep National Monument’s fire management programs are designed to meet resource management objectives prescribed for the various areas of the national monument and to ensure that the safety of firefighters and the public is not compromised.</p> <p>All wildland fires are effectively managed, considering resource values to be protected and firefighter and public safety, using the full range of strategic and tactical operations as described in an approved fire management plan.</p> <p>Sources: <i>NPS Management Policies 2006</i>; DO-18, “Wildland Fire Management”</p>
General Natural Resources / Restoration	<p>Native species populations that have been severely reduced in or extirpated from the national monument are restored where feasible and sustainable.</p> <p>Populations of native plant and animal species function in as natural a condition as possible, except where special considerations are warranted.</p> <p>Sources: <i>NPS Management Policies 2006</i>; NPS-77, “Natural Resources Management Guidelines”</p>

TOPIC	Current Laws and Policies Require That the Following Conditions Be Achieved at Hovenweep National Monument
Geologic Resources	<p>Hovenweep National Monument’s geologic resources are preserved and protected as integral components of Hovenweep’s natural systems.</p> <p>Sources: NPS <i>Management Policies 2006</i>; NPS-77, “Natural Resources Management Guidelines”</p>
Land Protection	<p>Land protection plans are prepared to determine and publicly document what lands or interests in land need to be in public ownership and what means of protection are available to achieve the purposes for which the national monument was created.</p> <p>Source: NPS <i>Management Policies 2006</i></p>
Lightscape Management/ Night Sky	<p>Excellent opportunities to see the night sky are available. Artificial light sources, both within and outside the national monument, do not degrade and adversely affect opportunities to see the night sky.</p> <p>Source: NPS <i>Management Policies 2006</i></p>
Native Vegetation and Animals	<p>The National Park Service will maintain as parts of the natural ecosystem all native plants and animals in the national monument.</p> <p>Sources: NPS <i>Management Policies 2006</i>; NPS-77, “Natural Resources Management Guidelines”</p>
Natural Soundscapes	<p>The National Park Service preserves the natural ambient soundscapes, restores degraded soundscapes to the natural ambient condition wherever possible, and protects natural soundscapes from degradation due to human-caused noise. Disruptions from recreational uses are managed to provide a high-quality visitor experience in an effort to preserve or restore the natural quiet and natural sounds. The National Park Service cooperates with partners to minimize or mitigate external impacts on soundscapes resulting from energy exploration, development, recreation, and transportation.</p> <p>Sources: NPS <i>Management Policies 2006</i>; DO-47, “Sound Preservation and Noise Management”</p>
Soils	<p>The National Park Service actively seeks to understand and preserve the soil resources of Hovenweep and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources.</p> <p>Natural soil resources and processes function in as natural a condition as possible, except where special considerations are allowable under policy.</p> <p>Sources: NPS <i>Management Policies 2006</i>; NPS-77, “Natural Resources Management Guidelines”</p>
Threatened and Endangered Species	<p>Federally listed and state-listed threatened and endangered species and their habitats are protected and sustained.</p> <p>Native threatened and endangered species populations that have been severely reduced in or extirpated from the national monument are restored where feasible and sustainable.</p> <p>Sources: Endangered Species Act; equivalent state protective legislation; Source: NPS <i>Management Policies 2006</i>; NPS-77, “Natural Resources Management Guidelines”</p>

TOPIC	Current Laws and Policies Require That the Following Conditions Be Achieved at Hovenweep National Monument
<p>Ethnographic Resources (continued)</p>	<p>All ethnographic resources determined eligible for listing or listed in the national register are protected. If disturbance of such resources is unavoidable, formal consultation with the state or tribal historic preservation officers, the Advisory Council on Historic Preservation, and American Indian tribes as appropriate, is conducted.</p> <p>The National Park Service will consult with tribal governments before taking actions that affect federally recognized tribal governments. These consultations are to be open and candid so that all interested parties may evaluate for themselves the potential impact of relevant proposals.</p> <p>Access to sacred sites and resources by American Indians continues to be provided when the use is consistent with national monument purposes and the protection of resources. The identities of community consultants and information about sacred and other culturally sensitive places and practices are kept confidential when research agreements or other circumstances warrant.</p> <p>Sources: National Historic Preservation Act; EO 13007 on American Indian Sacred Sites; Advisory Council on Historic Preservation implementing regulations; NPS <i>Management Policies 2006</i>; DO-28, "Cultural Resources Management Guidelines"</p>
<p>Museum Collections</p>	<p>All museum collections (objects, specimens, and manuscript collections) are identified and inventoried, catalogued, documented, preserved, and protected, and provision is made for their access to and use for exhibits, research, and interpretation.</p> <p>The qualities that contribute to the significance of collections are protected in accordance with established standards.</p> <p>Sources: National Historic Preservation Act; Archeological and Historic Preservation Act; Archeological Resources Protection Act; Native American Graves and Repatriation Act; NPS <i>Management Policies 2006</i>; DO-28 "Cultural Resources Management Guidelines"; Management of Museum Properties Act of 1955 (the "Museum Act"), 16 USC 18f; Historic Sites Act of 1935; NPS <i>Museum Handbook</i>; NPS <i>Museum Collection Facilities Strategy, Intermountain Region, 2005</i></p>
<p>Visitor Use and Experience</p>	
<p>Visitor Use and Experience</p>	<p>Hovenweep's resources are conserved "unimpaired" for the enjoyment of future generations. Visitors have opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the national monument. No activities occur that would cause derogation of the values and purposes for which the national monument has been established.</p> <p>For all zones within the national monument, the types and levels of visitor use are consistent with the desired resource and visitor experience conditions prescribed for those areas.</p> <p>Visitors to Hovenweep will have opportunities to understand and appreciate the significance of the national monument and its resources and to develop a personal stewardship ethic.</p> <p>To the extent feasible, programs, services, and facilities in the national monument are accessible to and usable by all people, including those with disabilities.</p> <p>Sources: NPS Organic Act; NPS <i>Management Policies 2006</i></p>



Location

Hovenweep National Monument

Colorado – Utah

RELATIONSHIP OF OTHER PLANNING EFFORTS TO THIS PLAN

Several plans have influenced or would be influenced by the approved general management plan for Hovenweep National Monument. These plans have been prepared (or are being prepared) by the National Park Service, the Bureau of Land Management (BLM), the states of Colorado and Utah, and county and local governments. Some of these plans are described here briefly, along with their relationship to this general management plan.

CANYONS OF THE ANCIENTS NATIONAL MONUMENT RESOURCE MANAGEMENT PLAN

This national monument encompasses 164,000 acres of federal land administered by the Bureau of Land Management. The monument is located about 3 miles west of Cortez, Colorado, and 12 miles west of Mesa Verde National Park. The monument contains the highest known archeological site density in the United States, with rich, well-preserved remnants of native cultures. The more than 6,000 recorded sites reflect all the physical components of past human life: villages, field houses, check dams, reservoirs, great kivas, cliff dwellings, shrines, sacred springs, agricultural fields, petroglyphs, and sweat lodges. Some areas have more than 100 sites per square mile. The number of sites is estimated to be 20,000 to 30,000 total. Four of the units of Hovenweep National Monument either adjoin or are surrounded by portions of Canyons of the Ancients National Monument.

The BLM preferred alternative emphasizes cultural resource values, tribal values, and cultural and natural resource protection and enhancement, while providing for resource use and development, including implementation of an outdoor museum concept for Canyons of the Ancients.

There are presently about 125 wells producing oil, natural gas, and CO₂ in the Canyon of the Ancients. The current average of 2 to 4 new wells a year is anticipated to continue on existing leases, with up to 121 new locations over the life of the monument plan. NPS staff will continue to work with BLM staff to prevent fluid mineral extraction activities from adversely affecting Hovenweep's resources.

Because the proposed management strategies for this monument could have implications for the future of Hovenweep, continued cooperation between the National Park Service and the Bureau of Land Management is essential in the development of the plan for the Canyons of the Ancients and the general management plan for Hovenweep. The National Park Service and the Bureau of Land Management are currently cooperating in ways such as joint patrols.

RESOURCE MANAGEMENT PLAN BLM MONTICELLO FIELD OFFICE

This plan is the Utah counterpart to the resource management plan for Canyons of the Ancients. The resource management plan and accompanying environmental impact statement describes and analyzes alternatives for the planning and management of public lands and resources administered by the BLM Monticello Field Office. When completed, the resource management plan revision will provide a set of comprehensive long-range decisions for managing resources and identifying allowable uses on the public land surface and federal mining estate administered by the Bureau of Land Management. Communication between the Bureau of Land Management and the National Park Service is essential in this decision-making process.

STATEWIDE COMPREHENSIVE OUTDOOR RECREATION PLANS – UTAH AND COLORADO

Utah's state comprehensive outdoor recreation plan was published in 2003. As part of this planning effort, several public meetings and surveys were conducted to identify outdoor recreation needs in the state.

Although most of the needs identified were related to urban areas (ball courts, parks, etc.), more trails were identified as a need in many of the responses (Utah Div. of Wildlife 2003). In the preferred alternative, Hovenweep, along with Canyon of the Ancients, would provide additional trails in the region to meet this need.

Colorado also completed its state comprehensive outdoor recreation plan in 2003. This plan states that more than 94% of Coloradoans participate in outdoor recreation. People most often participate in trails and driving pursuits, viewing/learning activities, and social pastimes. Family gatherings, walking for pleasure, outdoor sports events, visiting nature centers, sight-seeing, picnicking, and wildlife viewing engage the highest percentage of the population. Visits to historic sites were made by 62% of the Colorado public, according to the plan (Colorado State Parks 2003). Hovenweep provides opportunities for many of these activities.

MCPHEE RESERVOIR RECREATION PLAN (MONTEZUMA COUNTY, COLORADO)

This local planning effort is focused on expanded visitor use and facility development of McPhee Reservoir, the second largest body of water in Colorado, located about 10 miles north of Cortez.

The planned effort to promote the reservoir and increase visitation will be coordinated

with other area attractions, including Hovenweep National Monument. Planning for the future of Hovenweep must be coordinated with this and other regional planning efforts.

VANISHING TREASURES INITIATIVE

This program seeks to eliminate resource loss by addressing emergency project needs where structures are in immediate, imminent danger from natural erosive factors or the cumulative pressures of visitation. The program focuses on the replacement of an aging workforce that often has unique craft skills that will be lost without the addition of new, often younger workers who have the opportunity to work with these aging mentors prior to their retirement. Throughout its lifespan, the initiative would move from a posture of dealing with emergency projects and urgent personnel loss into a proactive program. This long-range plan seeks to achieve the Vanishing Treasures goals through the implementation of the following four action items:

- Develop a comprehensive computerized data management system.
- Establish adequate funding levels to achieve specific goals.
- Enact a career development and training program.
- Establish clear guidelines for planning and accomplishing preservation actions.

Hovenweep National Monument is a Vanishing Treasures park. Monument management, accordingly, will work to implement the goals of the initiative through resource monitoring, the development of comprehensive resource protection strategies, and cooperative management with other federal, state, and local resource management agencies.

PLANNING ISSUES AND CONCERNS

Scoping (information gathering) was conducted with park staff and the public in the early stages of this planning effort. The initial scoping newsletter was distributed the fall of 2002. Public meetings were held in Monticello, Utah; Blanding, Utah; and Cortez, Colorado in November 2002. The public expressed concerns about the impact of energy exploration and recovery, encroaching development, and the impacts of facilities development on the monument's resources. Based on the information collected during this phase, the following issues or concerns were identified.

CULTURAL RESOURCES

Management strategies are needed to protect, stabilize, restore, and maintain prehistoric structures, archeological sites, and cultural landscapes associated with the ancestral Pueblo peoples of Hovenweep and the Great Sage Plain ecosystem. This would include mitigating the impacts of erosion and visitor access on these resources. There is a need for additional analysis and documentation of the towers, archeological resources, and surrounding cultural landscape. The plan must also address the adequacy of park boundaries by identifying significant related resources outside the monument boundaries, determining if these resources are related to the monument's purpose and significance, and evaluating whether adequate protection measures are in place to preserve these resources. The plan must also describe appropriate protocols and methodology for conducting archeological research within the monument and for evaluating and analyzing the remnants of the cultural landscapes. This research and analysis can enhance our understanding of the lives of the ancestral Pueblo people.

NATURAL RESOURCES

A number of factors pose potential impacts to the monument's natural resources. Visitor use, climate change, and regional development could adversely affect the resources characteristic of the Great Sage Plain environment. The National Park Service recognizes that the cultural and natural resources of the monument are inextricably linked. Inappropriate management of one can lead to degradation of the other. The general management plan must identify management strategies to preserve natural resources and processes, including night skies, soundscapes, and views. It must also outline appropriate actions to manage and, where feasible, eradicate nonnative species.

VISITOR EXPERIENCE

Canyon of the Ancients National Monument adjoins four of the units of Hovenweep. The resources of both Hovenweep and Canyons of the Ancients are important to visitor understanding of the larger context of the ancestral Pueblo culture in the Great Sage Plain. Developing closer cooperation on resource protection and interpretation is important to the overall visitor experience at both monuments.

Goodman Point unit is the farthest unit from headquarters and yet is closest to suburban development; it has the greatest potential for increases in unmonitored visitation from the local population. Some researchers have determined that this type of visitation has resulted in cultural site damage. An issue that arose during scoping is the need for expanded interpretive and educational programs to make the public aware of the sensitivity of the monument's cultural resources and the role they can play in their protection.

Another issue that arose during scoping is the need to inform the public of the inherent risks

involved in visiting undeveloped areas of the monument.

Hovenweep needs a strategy for dealing with increased visitation at remote units and for coordination with the Bureau of Land Management, tribes, educational and scientific institutions, and friends groups.

INTERPRETATION AND EDUCATION

Public comments received in the visitor survey highlighted the need for expanded education and interpretive programs that address the broader context of ancestral Pueblo life and culture at Hovenweep and in the Great Sage Plain ecosystem. The plan will lay the foundation for regional visitor use and education plans and for preservation programs in partnership with the Bureau of Land Management (Anasazi Heritage Center, Monticello Field Office, Canyons of the Ancients National Monument); U.S. Forest Service; Edge of the Cedars State Park; Crow Canyon Archaeological Center; and other state, local, and private agencies and organizations. These programs can be of enormous benefit in informing visitors of the extraordinary importance of Hovenweep and the role visitors can play in resource protection and preservation. This would be an important component of a park interpretation plan.

MONUMENT OPERATIONS

Most of the facilities at Hovenweep, including the visitor center, campground, housing, and

roads, are adequate. However, the monument does not have an adequate maintenance facility. Maintenance operations currently are based from a 380-square-foot metal maintenance shop, two 10x10 pump houses, and a small storage building. The garages for monument housing are currently being used for maintenance storage. These facilities do not provide adequate fire suppression and other safety equipment, vehicle and material storage, water and power utilities, or meet other operational requirements. This plan must address the need for proper maintenance facilities for the monument.

COOPERATIVE MANAGEMENT

Resource protection and law enforcement at the monument are limited by existing staffing levels, which will not change in the foreseeable future. Cooperation with the Bureau of Land Management and other federal, state, and local agencies would strengthen law enforcement coverage for resource protection, visitor safety, and monitoring. The plan would establish the framework for developing or strengthening cooperative agreements with other law enforcement and resource protection agencies. This would include coordinating transportation and access issues with state and county officials, the Bureau of Land Management, and the Navajo Nation (the Cajon unit). The plan will also identify needs to conduct cross training of staff for interdisciplinary duties. (See appendix A for a list of existing cooperative agreements.)

IMPACT TOPICS—RESOURCES AND VALUES AT STAKE IN THE PLANNING PROCESS

IMPACT TOPICS TO BE CONSIDERED

Specific impact topics were developed to focus discussion and to allow comparison of the environmental consequences of each alternative. These impact topics were identified based on federal laws, regulations, and executive orders; NPS *Management Policies 2006*; NPS knowledge of limited or easily impacted resources; other agency concerns; and public input. A brief rationale for the selection of each impact topic is provided, as is the rationale for dismissing other topics from further consideration.

Archeological Resources

The archeological resources of Hovenweep represent nationally significant examples of ancestral Pueblo culture. The six units of Hovenweep are in the center of the highest density of known archeological sites in the United States. In 1889, the Goodman Point unit was the first archeological area to be set aside by the federal government, and Goodman Point ruin is one of the largest 13th century villages in the San Juan River basin. Some of the actions proposed in the general management plan could pose impacts on these significant resources, so this topic will be analyzed.

Prehistoric Structures

The Hovenweep structures are some of the best preserved, best protected, and most visually striking and accessible examples of 13th century pueblo architecture and community locations within the northern San Juan River basin. Combined with the associated sites and landscapes, the structures, which include towers, walls, check dams, and trails, provide evidence of a vibrant culture. Actions proposed in the general management plan must be evaluated for their potential to affect these resources, so this topic will be retained for analysis.

Ethnographic Resources

An ethnographic resource is defined by the National Park Service as a “site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it.” The six units of Hovenweep contain resources of significance to the tribes and pueblos that trace their descent from the ancestral people. These resources include springs, canyons, and other landforms; pictographs; and other cultural sites. Actions proposed in the general management plan must be evaluated for their potential to affect these resources, so this topic will be analyzed.

Cultural Landscapes

The National Park Service defines a cultural landscape as “a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by uses reflecting cultural values and traditions.”

Cultural landscapes are the result of the long interaction between humans and the land, and as such, they provide a living record of an area’s past—a visual chronicle of its history. The sites, structures, and other cultural resources represent important features of cultural landscapes created and abandoned by the ancestral Pueblo peoples. Because the actions described in the alternatives could pose some impacts on these landscape features, this topic will be analyzed.

Viewsheds

Maintaining the natural views is essential to preserving the character of the immediate canyons, mesa tops, and surrounding region.

Unobstructed natural views are important, because they contribute to feelings of remoteness, solitude, and a sense of timelessness—fundamental qualities of the Hovenweep experience. As expressed through a visitor survey conducted by Northern Arizona University (Delost and Lee 2000), and comments received during scoping for this document, these qualities are desired and are highly sought by monument visitors.

Natural views are important at all of the monument's units. Members of the planning team conducted a geographic information system – based viewshed analysis in 2005 to evaluate critical sightlines from the monument. This analysis identified two critical viewsheds. Because the monument's units are so small, most of the views are of non-NPS lands.

The first critical view is from the back of the visitor center at Square Tower unit, looking due south to due east. This landscape is expansive and includes Little Ruin Canyon in the foreground, extending out to Sleeping Ute Mountain, 20 miles away. Currently, there are very few modern impacts on this natural setting, with the exception of the trail and a power transmission line. Landowners in the viewshed include the Navajo Nation, the Bureau of Land Management, and state and private entities.

The second critical view is that seen from the trailhead at the Goodman Point unit and a similar vista from the large, central pueblo ruin. From the trailhead, and to a lesser extent from the primary ruin site, one can see more than 180 degrees to the west, through the south, and to the east with the dramatic profile of Sleeping Ute Mountain dominating the southern horizon. Landowners in this viewshed include the Bureau of Land Management and private entities.

These two viewsheds are considered most critical, but realistically, any high profile or extensive development on a border of any one of the units would have a significant impact on the visitor experience at that unit. The

landscape of each of these small units is contiguous with the surrounding terrain. Vegetation is nonexistent to sparse, and at best, offers only minimal cover to mask any outside development.

A regional pattern of development that has evolved during the past decade indicates that there probably will be future land-use pressures on the monument from both the eastern and the western boundaries. The expanding population of the Navajo Nation is reflected in the related growth of homesteads on reservation lands bordering the Utah units of the monument. The scale of structures built in the viewshed could affect the visitor experience. Residential expansion from Cortez is impacting the traditional farmlands and pinyon/juniper uplands surrounding the Colorado units. Suburban-style development has been established within a mile of Goodman Point; other units are threatened with similar encroachment.

In both states, outside entities have begun using the open, seemingly empty nearby lands for commercial development. Pressure to develop oil and gas leases in this zone is high. A large CO₂ processing plant is currently under construction (2007) to the west of the Goodman Point unit. There are efforts under way to bring rural water lines past Goodman Point along Road P; Montezuma County intends to pave this road in 2008. Extensive earthen berms and blowing dust from the land farm within a mile of the Square Tower unit also pose the potential of adverse impacts on viewsheds. The influence of all these factors is expected to increase during the upcoming years, creating the potential for intrusions on natural views. This topic will be analyzed and the potential for actions outside the park boundary to intrude on viewsheds considered in the analysis of cumulative impacts.

Soils

The soil at Hovenweep originated from erosion of the sandstone bedrock; it was deposited by the wind or water in relatively recent times. Microbiotic crusts are found in the area and are composed of soil particles

bound together by organic materials. These crusts are important to the ecology of the southwest because they have a function in soil stability, nutrient contribution to plants, water infiltration, seedling germination, and plant growth. Soils and microbiotic crusts can be affected by development, restoration, and visitor use. Alternatives presented in this plan could affect soils and related resources, so this topic is retained for analysis.

Vegetation

Hovenweep National Monument's six units are home to a variety of Colorado Plateau vegetation types. The Goodman Point unit contains an almost pristine representation of pinyon-juniper/sage plant community. There is a concern over the spread of nonnative plants in the monument and the adverse effects they might have on native plants. Alternatives presented in this plan could affect native and invasive nonnative vegetation, so this topic is retained.

Wildlife

Hovenweep National Monument is home to a great variety of birds and other wildlife. Wildlife concerns at the park include preserving natural habitats in the outlying areas and maintaining healthy populations. Alternatives presented in this plan could affect wildlife species or important habitat, so this topic will be analyzed.

Special Status Species

Special status species include those species classified as endangered, threatened, candidate, or species of concern at either the federal or state level. Analysis of these species is required by the Endangered Species Act, *NPS Management Policies 2006*, the National Environmental Policy Act, and other regulations.

For this general management plan, a list of federally threatened, endangered, and

candidate species was prepared by the U.S. Fish and Wildlife Service (USFWS) and forwarded to the National Park Service in a memorandum dated March 3, 2003. This information was updated on November 23, 2010, from the current species list for Montezuma County and San Juan County on the USFWS endangered species website.

Other information on listed species was obtained from the Utah Division of Wildlife Resources (UDWR 2003) and Colorado Division of Wildlife (CDOW 2003). Table 2 contains the federally listed species that may inhabit the vicinity of the monument. Most of these species are not known to occur in the monument and were dismissed from further analysis in the following section of this document.

There are several state-listed species for San Juan County, Utah, and Montezuma County, Colorado. The peregrine falcon and northern goshawk might be in the area. No other state-listed species are known to inhabit the monument.

Soundscapes

NPS Management Policies 2006 (§ 4.9) requires park managers to strive to preserve the natural soundscape of a park, which is defined as the lack of human-related sound and prevalence of natural sounds. As shown in a recent survey, park visitors value natural quiet. Natural soundscapes prevail in the outlying units of the monument and to a slightly diminished degree at the main unit. These sounds can be associated with the physical and biological resources such as the sounds of flowing water or birds. Implementing the action alternative could alter the soundscape in one or more areas of the monument, so this topic is retained for analysis.

Table 2: Federally Listed Species that May Inhabit the Vicinity of the Monument

(E=Endangered, T=Threatened, C=Candidate, SOC=Species of Concern)

WILDLIFE	
Southwestern willow flycatcher (E)	<i>Empidonax traillii extimus</i>
Mexican spotted owl (T)	<i>Strix occidentalis lucida</i>
Colorado pikeminnow (E)	<i>Ptychocheilus lucius</i>
Razorback sucker (E)	<i>Xyrauchen texanus</i>
Humpback, bonytail, and least chubs	
California condor	<i>Gymnogyps</i>
Arctic peregrine	<i>Falco peregrinus spp.</i>
Yellow-billed cuckoo (C)	<i>Coccyzus americanus</i>
Long-nosed leopard lizard (SOC)	<i>Gambelia wislizenii</i>
Gunnison sage-grouse (C)	<i>Centrocercus minimus</i>
Mountain plover	<i>Charadrius</i>
PLANTS	
Mancos milk-vetch (E)	<i>Astragalus humillimus</i>
Mesa Verde cactus (T)	<i>Sclerocactus mesae-verdae</i>

Night Skies

NPS policy requires the National Park Service to preserve, to the extent possible, the natural lightscapes of parks and to seek to minimize the intrusion of artificial light (light pollution) into the night scene (NPS *Management Policies 2006*, §4.10). The clarity of night skies is important to visitor experience as well as to the ecological systems of the area. Artificial light sources both within and outside the park have the potential to diminish the clarity of night skies.

The rural setting of the monument currently provides for relatively dark nights. Even minor elements of artificial lighting within park boundaries could affect the pristine quality of regional night skies. Given these considerations, the topic of night sky resources is retained for further analysis.

Visitor Use and Experience (including public health and safety)

The Organic Act of 1916 and NPS *Management Policies 2006* require the National Park Service to provide opportunities for the enjoyment of a park’s resources and values. This enjoyment comes

from activities that are appropriate for each park unit. Scenic and historic views, and the ability to view the ruins up close, are considered important contributing factors to positive visitor experiences in this monument. An internal issue that arose during scoping is the importance of making the public aware of the inherent risks involved in visiting undeveloped areas of the monument. Implementing the action alternative could affect visitor use and experience in the monument, so this topic is retained for analysis.

Socioeconomic Environment

The National Environmental Policy Act (NEPA) requires an examination of social and economic impacts caused by federal actions. Management changes at Hovenweep National Monument can affect the socioeconomic conditions of nearby communities, so this topic is retained for analysis.

Monument Operations

Operations include staffing; maintenance; facilities; ability to enforce park regulations and protect park values, employee and visitor health and safety; and administrative access.

In view of the changes in monument operations and administration that are already in effect, there would be only slight modifications to the existing situation that would result from implementing the action alternative. The efficiency of operations would increase slightly, resulting in a negligible to minor long-term beneficial effect. However, as the construction of a new maintenance facility could have an appreciable beneficial impact on monument operations and facilities, this topic is retained for further analysis.

IMPACT TOPICS DISMISSED FROM FURTHER CONSIDERATION

Museum and Archival Collections

The collections of Hovenweep National Monument contain more than 108,000 artifacts and associated field records. However, these collections are stored primarily at the Anasazi Heritage Center under a cooperative agreement with the Bureau of Land Management. Other repositories with only limited items include the Museum of Northern Arizona, Northern Arizona University, the NPS Western Archeology Center, and the University of New Mexico. None of the actions proposed under the alternatives pose impacts on these resources. The cooperative agreement will be unaffected by the general management plan, and the collections at the Anasazi Heritage Center are accessioned and cataloged, preserved, protected, and made available for access and use according to NPS standards and guidelines. Therefore, this topic has been dismissed from further analysis.

Air Quality

The Clean Air Act states that managers have a responsibility to protect park air quality-related values from adverse air pollution impacts. The monument is in a Class II airshed according to the 1977 amendments to the Clean Air Act. In Class II airsheds, modest increases in air pollution are allowed beyond baseline levels for particulate matter, sulfur

dioxide, nitrogen, and nitrogen dioxide, provided that the national ambient air quality standards, established by the Environmental Protection Agency (EPA), are not exceeded. There are no major air pollution sources within or near the park. Vehicle exhaust is the most common pollutant in the vicinity of the park and results from mineral extraction operations, agricultural operations, visitor use, and monument operations. Activity at the land farm adjacent to Square Tower unit generates large plumes of dust from the earthen berms, and both the plumes and the berms are visible from the road and from Square Tower.

Coal-fired power plants are the principal sources of air pollutants in the greater Four Corners region. Haze from dispersed air pollution is a concern in the region most of the year. There is ongoing pressure to implement plans for additional coal-fired power plants in the region. Were these plants to come online, it would lead to further deterioration of regional air quality.

Should the action alternative be selected, local air quality could be temporarily impacted by construction activities. Hauling material and operating construction equipment would result in increased vehicle emissions in a localized area. Volatile organic compounds, nitrogen compounds, carbon monoxide, and sulfur dioxide emissions would disperse fairly quickly from the construction area. This degradation would last only as long as construction activities occurred and would most likely have a negligible effect on regional pollutant levels. Fugitive dust from construction could intermittently increase airborne particulate concentrations in the area near the project site, but mitigating measures would reduce potential adverse effects to a negligible level.

In summary, if the action alternative were to be implemented, local air quality would be temporarily degraded by dust and emissions from construction equipment and vehicles. Regional air quality would be no more than negligibly affected, so air quality is dismissed as an impact topic in this document.

Geology

Two geologic strata are visible within the monument. These are the Burro Canyon and Dakota formations. The Burro Canyon formation was laid down as river or lake deposits in the early Cretaceous period between 100 and 135 million years ago. It is composed of white conglomeratic shale and sandstone layers with interspersed pebbles and cobbles of chert, silicified limestone, and quartzite.

The Dakota sandstone lies atop the Burro Canyon formation. Deposited during the late Cretaceous period, it makes up most of the cliffs and ledges on Cajon Mesa. The Dakota is composed of yellow sandstones, gray mudstones, and a few thin beds of coal.

Springs and seeps occur where Dakota sandstone meets the relatively impermeable shale in the Burro Canyon formation. Wind and water erosion have created rock shelters and alcoves in the sandstone that were used by American Indians for shelter and often as a source of water.

Neither of the alternatives described in this document would affect the geology of the park or region, so this topic is dismissed from further analysis.

Oil and Gas Development

There have been no oil and gas leases issued within the boundaries of the monument.

The Bureau of Land Management had proposed in 1989 and 1990 that the secretary of the interior issue “protective leases” to prevent the potential drainage of gas from lands within the monument that the Bureau of Land Management felt constituted a loss of revenue for the federal government. The National Park Service opposed this position, arguing that Hovenweep was explicitly exempted from the mineral lease laws by the 1947 Mineral Leasing Act for Acquired Lands, which specifically exempts NPS lands from leasing.

Existing records indicate that the NPS legal interpretation prevailed on this issue. While some earlier BLM documents indicated that an oil and gas lease might have been issued on the Holly unit, extensive research clarified the most recent status—2002 BLM maps indicate that all leases within the boundaries of Hovenweep National Monument have been withdrawn from potential leasing. Therefore, this topic is dismissed from further analysis. However, visual and auditory impacts resulting from oil and gas development outside the monument boundaries will be analyzed in the cumulative impacts sections for viewsheds, soundscapes, and night skies.

Water Resources (water quality, water quantity, floodplains, and wetlands)

No perennial streams flow across monument lands. Springs and seeps may occur where the Dakota sandstone meets Burro Canyon shale. Water percolates slowly through the porous sandstone until it meets the relatively impermeable shale layer and then travels horizontally to a canyon wall where it drips or flows out. A spring in the Cajon unit once provided water for livestock on the adjacent Navajo Reservation but is no longer in use. Potable water for the monument’s headquarters and visitor contact facility at Square Tower unit comes from a 1,400-foot-deep well on the unit.

Primary surface water resources in the vicinity include Yellow Jacket and Negro Canyons, which are ephemeral tributaries to McElmo Creek, southwest of the monument, which in turn joins the San Juan River at Aneth, Utah. Key factors that may influence surface water quality in the region include sparse vegetative cover, erosive and saline soils, rapid runoff, and livestock grazing. The impacts of these factors are considered negligible in the monument because of protective measures applied by the National Park Service. These measures include a prohibition on livestock grazing and mineral extraction.

Effects on water quality are regulated by NPS management policies and the Clean Water Act (33 USC 1344). The results of a water quality

study conducted by the National Park Service in 2000 found 14 groups of parameters that exceeded screening criteria at least once within the study area. The pH, cadmium, copper, lead, selenium, and zinc exceeded their respective EPA criteria for the protection of freshwater aquatic life. Nitrate, nitrite plus nitrate, sulfate, cadmium, chromium, lead, arsenic, and nickel exceeded their respective EPA drinking water criteria. Fecal-indicator bacteria concentrations (total coliform and fecal coliform) and turbidity exceeded the NPS screening limits for freshwater bathing and aquatic life, respectively (NPS 2000). NPS *Management Policies 2006* (§4.6.3) requires that the National Park Service "Take all necessary actions to maintain or restore the quality of surface waters and ground waters within the parks consistent with the Clean Water Act and all other applicable federal, state, and local laws and regulations, . . ."

Water quality protection measures (mitigation) and standard operating procedures would be used to protect water quality and prevent its degradation from construction or other park operations. Such measures include sedimentation check dams, surface silt fencing, and revegetation. These procedures are being applied now and would apply in any alternative presented in this document. Construction or other surface-disturbing actions occurring as a result of implementing the action alternative would require site-specific environmental analysis and include water quality and waterway protection measures such as those mentioned above.

Analysis of potential impacts on floodplains and wetlands is required by Executive Orders 11988 (floodplains) and 11990 (wetlands), the Clean Water Act, and NPS *Management Policies 2006*. No 100-year or 500-year floodplains have been identified in the monument. Although no hydric soils are known to occur in the region, small, isolated areas that exist around some seeps and springs, and which are closed to the public, could be considered wetlands. These are not classified by the National Wetland Inventory,

but are well known by park staff, and no park operations or visitor service development is proposed in any alternative that would adversely affect these areas. Implementing either of the alternatives would not affect water quality, water quantity, floodplains, or wetlands and would not interfere with protection mandates, so the topic of water resources is dismissed from further analysis.

Wilderness and Wild and Scenic Rivers

Wilderness areas and wild and scenic rivers are congressional designations. There are no areas or rivers with such designations in Hovenweep, and there are no areas or rivers that would be eligible for possible designation. The land area of the six units of Hovenweep total only 785 acres, far below the 5,000 acres generally considered the minimum for wilderness designation, so this topic is dismissed from further analysis.

Selected Threatened or Endangered Species

The following federally listed species are dismissed from further analysis for the reasons provided.

Mexican Spotted Owl. These owls prefer complex forest structures or rocky canyons that contain uneven-aged, multilevel and old-aged, thick forests (CDOW 2003). No habitat of this type exists in any unit, and there is no record of spotted owls being seen in the monument.

Southwestern Willow Flycatcher. This flycatcher is a riparian obligate species that prefers dense thickets of willow or tamarisk for nesting, foraging, and migratory habitat. There is no adequate habitat of this type in any of the units of the monument, and there are no records of this bird being seen in the monument.

Yellow-billed Cuckoo. In Utah, this species was historically uncommon to rare and found along river bottoms. It requires large blocks of thick riparian woodland to breed. There is no habitat of this type available in any of the units

of the monument, and there are no records of this bird being seen in the monument.

Gunnison Sage-grouse. Gunnison sage-grouse (federal candidate species) is a small species of sage-grouse. Although federal candidates do not receive protection under the Endangered Species Act, the National Park Service takes care to minimize impacts on these species. The Gunnison sage-grouse is considered by the U.S. Fish and Wildlife Service to be a high-priority species for conservation efforts. Although the monument is in their historic range, Gunnison sage-grouse now inhabit drier, flatter, and lower habitat that is well to the north of the monument (CDOW 2003).

California Condor, Mountain Plover, and Arctic Peregrine. These birds were on the list provided by the U.S. Fish and Wildlife Service; however, there is no record of these species having been seen in the monument.

Long-nosed Leopard Lizard. The long-nosed leopard lizard is a federal species of concern. It is also listed in Utah and Colorado. It has declined in range and abundance over the past 100 years, owing to agricultural, residential, and commercial development. It is a relatively large lizard that can slightly alter its coloration for camouflage purposes. In Utah, the species lives throughout much of the state, primarily in open desert and semi-desert areas that allow them to run. During cold times of the year, they seek refuge in burrows and become inactive. According to the distribution map developed by the Utah Division of Wildlife Resources, none of the Utah monument units are known habitat for this species (UDWR 2003). All the units in Colorado are above 5,200 feet in elevation and therefore are out of the range for this species (USFWS 2003).

Colorado Pikeminnow, Razorback Sucker, Bonytail Chub, Least Chub, and Humpback Chub. There are no perennial streams in the monument that could provide habitat for these fishes. There would be no removal of water from tributaries in the San Juan River

basin that would affect either of these fish under either of the alternatives.

Mancos Milk-vetch and Mesa Verde Cactus. The Mancos milk-vetch occurs on Point Lookout sandstone outcrops in Mesa Verde National Park and out of the project area. The Mesa Verde cactus occurs on hot, low-elevation shale hills in the southern part of Montezuma County on the Ute Mountain Ute Indian Reservation. Neither plant is known to occur in the project area.

State-listed Species

There are several state-listed species for San Juan County, Utah, and Montezuma County, Colorado, but a review of current data indicates that none of these are known to occur in the monument.

Prime or Unique Farmlands

In August 1980, the Council on Environmental Quality (CEQ) directed that federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's Natural Resource Conservation Service as prime or unique. Prime or unique farmland is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts.

Of the eight soil units within the boundaries of Hovenweep, one (Wetherill loam) is considered prime farmland only if irrigated. There is no irrigated farmland in the monument and no change in the use of this soil unit is proposed, so the topic of prime and unique farmlands is dismissed.

Natural or Depletable Resources Requirements and Conservation Potential

Consideration of these topics is required by 40 CFR 1502.16. The National Park Service has adopted the concept of sustainable design as a guiding principle of facility planning and development (NPS *Management Policies* 2006 §9.1.1.7). The objectives of sustainability are to design facilities to minimize adverse effects on

natural and cultural values, to reflect their environmental setting, and to maintain and encourage biodiversity; to operate and maintain facilities to promote their sustainability; and to illustrate and promote conservation principles and practices through sustainable design and ecologically sensitive use. Essentially, sustainability is the concept of living within an environment, while having the least impact on it.

Through sustainable design concepts and other resource management principles, both of the alternatives analyzed in this document would conserve natural resources and would not result in an appreciable loss of natural or depletable resources. Because impacts on such resources would be negligible, this topic is dismissed from further analysis in this document.

Energy Requirements and Conservation Potential

Implementation of the action alternative could result in new facilities with inherent energy needs. In the action alternative, new facilities would be designed with long-term sustainability in mind. The National Park Service has adopted the concept of sustainable design as a guiding principle of facility planning and development (*NPS Management Policies 2006*, §9.1). The objectives of sustainability are to design facilities in such a way as to minimize adverse effects on natural and cultural values, to reflect their environmental setting, and to require use of the least amount of nonrenewable fuels or energy.

Implementation of the action alternative could result in an increased energy need, but this need is expected to be negligible when viewed in a regional context. Thus, this topic is dismissed from further analysis.

Urban Quality and Design of the Built Environment

Consideration of this topic is required by 40 CFR 1502.16. Urban areas and vernacular designs are not concerns in this rural area. Any new structures called for in an alternative

would include rural design concepts, natural colors, and materials that do not detract from the environment. Given this mitigation, no further analysis of this topic is necessary. However, elements of the built environment resulting from community development outside the park could impact the integrity of views of the regional landscape from the monument. These potential impacts will be analyzed in the cumulative impacts sections for viewsheds, soundscapes, and night skies.

Indian Trust Lands

Secretarial Order 3175 requires that any anticipated impacts on Indian trust resources from a proposed action of agencies of the Department of the Interior be explicitly addressed in environmental documents. The secretary of the interior holds no lands in Hovenweep National Monument in trust solely for the benefit of American Indians because of their status as American Indians. However, local tribes having any implied or explicit rights to use lands or resources on the monument would continue to have these rights honored in accordance with law and NPS policy.

Environmental Justice

Presidential Executive Order 12898, “General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. According to the Environmental Protection Agency, environmental justice is the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and

commercial operations or the execution of federal, state, local, and tribal programs and policies.

The goal of “fair treatment” is not to shift risks among populations, but to identify potentially disproportionately high and adverse effects and identify alternatives that could mitigate these impacts.

The lands surrounding Hovenweep National Monument contain both minority and low-income populations; however, environmental justice is dismissed as an impact topic for the following reasons:

- The monument staff and planning team actively solicited public participation as part of the planning process and gave equal consideration to all input from persons regardless of age, race, income status, or other socioeconomic or demographic factors.
- Implementation of the preferred alternative would not result in any identifiable adverse human health effects.
- The impacts associated with implementation of the preferred alternative would not disproportionately affect any minority or low-income population or community.
- Implementation of the preferred alternative would not result in any identified effects that would be specific to any minority or low-income community.
- The impacts on the socioeconomic environment resulting from implementation of any of the action alternatives would be beneficial. In addition, the park staff and planning team do not anticipate the impacts on the socioeconomic environment to appreciably alter the physical and social structure of the nearby communities.

Therefore, environmental justice was dismissed as an impact topic.

BOUNDARY ADJUSTMENTS

The General Authorities Act of 1970 directs the National Park Service to identify potential boundary adjustments in general management plans. The criteria to evaluate any proposed changes to the existing boundaries of individual park units include the following:

- an analysis of whether the existing boundary provides for the adequate protection and preservation of the natural, historic, cultural, scenic, and recreational resources integral to the unit
- an evaluation of each parcel proposed for addition or deletion based on this analysis
- an assessment of the impact of potential boundary adjustments taking into consideration the factors listed above, as well as the effect of the adjustments on the local communities and surrounding areas

Boundary adjustments may be recommended in order to

- protect significant resources and values or to enhance opportunities for public enjoyment related to park purposes
- address operational and management issues, such as the need for access or the need for boundaries to correspond to logical boundary delineations such as topographic or other natural features or roads
- otherwise protect park resources that are critical to fulfilling park purposes

Section 1217 of the law provides that in proposing any boundary change, the secretary of the interior shall

- consult with affected agencies of state and local governments, surrounding communities, affected landowners, and private national, regional, and local organizations
- apply the criteria developed pursuant to section 1216 and accompany the

proposal with a statement reflecting the results of the application of such criteria

- include an estimate of the cost of acquisition of any parcels proposed for acquisition together with the basis for the estimate and a statement on the relative priority for the acquisition of each parcel within the priorities for other lands in the unit and the national park system

As part of the general management planning process, the National Park Service has identified and evaluated boundary adjustments that may be necessary or desirable to carry out the park's purposes. As stated in *NPS Management Policies 2006*, all recommendations for boundary changes must meet the following criteria:

1. The added lands will be feasible to administer, considering their size, configuration, ownership, the presence of hazardous substances or nonnative species, costs, impacts on local communities, etc.
2. Other alternatives for management and resource protection are not adequate.

The National Park Service must identify and use, to the maximum extent possible, alternatives to the direct federal purchase of privately owned lands. The National Park Service can acquire only the minimum amount of land necessary to achieve management objectives, and it can cooperate with landowners; other federal agencies; tribal, state, and local governments; and the private sector to manage land for public use or protect it for resource conservation. The authorized boundaries of Hovenweep National Monument encompass 785 acres in six separate units. A number of related resources are located on adjacent lands. Much of the land surrounding the various units is under the jurisdiction of the Bureau of Land Management or the Navajo Nation.

Cajon, one of two units in Utah, is within the Navajo Nation. Three of the four units in Colorado (Cutthroat Castle, Hackberry

Group, and Holly Group) are encompassed by Canyons of the Ancients National Monument. Goodman Point, the fourth unit in Colorado outside the town of Cortez, adjoins Canyons of the Ancients. Remnants of the Goodman Point ancestral Puebloan community are found on private lands adjacent to the unit. However, these resources have been impacted by agricultural uses since the late 19th century. Consequently, the question of external resources focuses on the Square Tower unit.

Portions of resource areas associated with Hovenweep south and east of the Square Tower unit of the monument were evaluated in a 1991 archeological survey conducted for the Bureau of Land Management. These areas subsequently were included in BLM's Resource Protection Zone. In general, the density of identified sites decreases as distance from the canyon-head settlements (see p. 8) increases. None of the individual sites identified in the archeological survey or any other known sites on adjacent lands are critical to the purposes of Hovenweep National Monument. However, taken as a whole, these outlying sites are important in interpreting a more complete story of human occupation at Hovenweep, which can enhance visitor understanding and enjoyment. The surveyed lands and some other known sites are within the monument's viewshed, which has been identified by park visitors as being very important to the quality of their experience. In general, the viewsheds of the monument's units extend well beyond the units' boundaries and include lands that have not been surveyed.

A variety of ways may be employed to encourage protection of neighboring lands' resources. Park management would work with adjacent landowners and public land managers to develop strategies for protection of critical sightlines and views from the monument. Alternative B proposes that the park work in conjunction with the surrounding communities and other federal, state, and local agencies to preserve viewsheds, soundscapes, and night skies. A land protection plan could be undertaken

after implementation of the general management plan, as it can provide a more detailed analysis of external issues as well as guidance for the park in developing protection strategies for related resources outside the park boundary. These strategies could include, but are not limited to:

cooperative agreements; conservation easements; participation in regional consortiums; and use of local planning and zoning processes.

ALTERNATIVES, INCLUDING THE
PREFERRED ALTERNATIVE

2



INTRODUCTION

This general management plan / environmental assessment presents two alternatives, including the National Park Service's preferred alternative, for future management of Hovenweep National Monument. The alternatives are based on the national monument's purpose, significance, special mandates, and desired future conditions for the national monument. This chapter presents the alternative concepts and the management zones that would be applied as part of the preferred alternative. This chapter also includes user capacity indicators and standards, actions common to both alternatives, mitigative measures, the environmentally preferred alternative, and alternatives and actions considered but dismissed from further consideration.

Alternative A, the no-action alternative, is the continuation of current management and alternative B is the preferred alternative.

Many aspects of the desired future conditions in Hovenweep National Monument are defined in the establishing legislation, the national monument's purpose and significance statements, and the servicewide mandates and policies (described earlier). Within these parameters, the National Park Service solicited input from the public, NPS staff, government agencies, associated tribes, and other organizations, regarding issues and desired conditions for the national monument. The planning team gathered information about existing visitor use and the condition of the national monument's facilities and resources. They considered which areas attract visitors and which areas have sensitive resources. Using that information, the team developed a set of four management zones for the national monument. The preferred alternative reflects the range of ideas proposed by the national monument staff and the public.

This chapter describes the management zones and the alternatives for managing Hovenweep National Monument for the next 15 to 20 years. It includes tables summarizing the key differences between the alternatives and the key differences in the impacts that would be expected from implementing either alternative. (The summary of impacts table is based on the analysis in "Chapter 4: Environmental Consequences.") This chapter also contains descriptions of the mitigating measures that would be used to reduce or avoid impacts, the future studies that would be needed, and the environmentally preferable alternative.

BUILDING BLOCKS – MANAGEMENT ZONES AND ALTERNATIVES

The building blocks for reaching an approved plan for managing a national park system unit are the management zones and the management alternatives. These have been developed within the scope of the national monument's purpose, significance, mandates, and legislation.

Management zones prescribe desired conditions for resources and visitor experiences in different parts of the national monument. Although management zones are developed for each unit of the national park system, the management zones for one park unit are not likely to be the same as those of any other national park unit, although some might be similar. The management zones developed for this unit identify the range of potential appropriate resource conditions, visitor experiences, and facilities that fall within the scope of Hovenweep National Monument's purpose, significance, and special mandates.

This general management plan / environmental assessment presents two alternatives for the future management of Hovenweep National Monument. Alternative A, the no-

action alternative, which would involve continuing the existing management direction, is included as a baseline for comparing the consequences of implementing the preferred alternative. Alternative B, the preferred alternative, presents a different way to manage resources and visitor uses and to improve facilities and infrastructure at the national monument. This alternative embodies what the public and the National Park Service want to see accomplished at Hovenweep National Monument with regard to natural resource conditions, cultural resource conditions, and visitor use and experience.

As was mentioned previously in the “Guidance for Planning” section, the National Park Service would continue to follow existing agreements and servicewide mandates, laws, and policies, regardless of the alternative that is ultimately selected. These mandates and policies are not repeated in this chapter.

IMPLEMENTING THE PREFERRED ALTERNATIVE

The preferred alternative focuses on *what* resource conditions and visitor uses, experiences, and opportunities should be at the national monument, rather than on the details of *how* these conditions and uses or experiences should be achieved.

The preferred alternative better meets the monument’s purpose, need, and objectives compared with the no-action alternative by providing additional protection for the cultural and natural resources of the monument, expanding the range of visitor experiences, and enhancing the monument’s outreach and partnership programs.

More detailed plans or studies will be required before most conditions proposed in the alternatives can be achieved. Implementing any alternative also depends on future funding and environmental compliance. This plan does not guarantee that any money will be forthcoming. The plan

establishes a vision for the future that will guide the day-to-day and year-to-year management of the national monument, but full implementation could take many years.

MANAGEMENT ZONE DESCRIPTIONS

The management zones for Hovenweep describe visitor experiences, resource conditions, and appropriate activities and facilities. They were presented to the public in Newsletter 2 and were modified in response to public comments.

In formulating the preferred alternative, the management zones were placed in locations on maps of the six units of the national monument according to the overall intent (concept) of the alternative.

The following narrative and table 3 contain the descriptions of the management zones developed for Hovenweep National Monument.

Operations and Visitor Services Zone

This zone would encompass the main visitor access points to the monument as well as the main monument administrative and operations facilities. It would include the visitor center, comfort stations, parking lots, roads and trails, campground, picnic areas, and educational and interpretive facilities. Administrative facilities would include headquarters, maintenance areas, monument housing, and other facilities. Visitors in this zone would receive an orientation to Hovenweep and learn about the various ways to explore its diverse resources.

Canyon and Mesa Zone

The purpose of this zone would be to present to the visitor a cultural and natural scene reminiscent of that encountered by explorers who first visited Hovenweep in the 19th century. This zone would protect many of the monument’s outstanding cultural resources, such as the towers and village sites for which Hovenweep was set aside as a national

monument. These sites comprise the cultural landscapes that illustrate the ancestral Pueblo people's adaptation to the environment.

Development in this area would be limited to unobtrusive interpretive signs and natural surface trails compatible with the landscape settings created by the ancestral people. Preserving the integrity of the setting and the ability to experience solitude would be priorities.

Four Corners Exploration Zone

The purpose of this zone would be to protect and preserve the distinct natural features and solitude of the southwest desert environment. This zone would not contain the monument's most significant cultural resources. The lands in this zone would reflect the prehistoric and historic landscape and natural setting that was home to the ancestral people. Natural processes would be allowed to evolve in the Four Corners Exploration zone unless prevented by requisite agency policies and guidelines. There would be only minimal development, such as directional signs and primitive trails, in this zone. Trails in this zone could link to trails in other public lands.

Visitors could find some sense of adventure and challenge in this area.

Sensitive Resources Zone

The purpose of this zone would be to protect the monument's most sensitive and vulnerable resources. These include both cultural resources such as rock art, structures, and archeological sites, and natural resources such as seeps, springs, plant species, and other natural resources that have important cultural associations. Resource preservation would be the overarching management goal. Visitor access would be limited to guided tours or other activities directed by monument staff. There would be no self-guiding visitor experience. Research activities for resource inventory and monitoring purposes could be allowed at the request of and under the overall supervision of the National Park Service. There would be no facilities or signs of management operations or visitor use.

Table 3 describes in more detail the resource conditions, visitor experiences, character and level of development, and appropriate management actions in each of the management zones.

Table 3: Management Zones

Zone Prescription	Resource Condition	Visitor Use and Experience	Character and Level of Development/Management Activities
<p>Operations and Visitor Services</p> <p>Visitors would receive their initial orientation to the monument, including information about monument resources, programs, and services.</p>	<p>Natural processes are understood and necessary visitor-related and NPS operational facilities in this zone harmonize with these processes to the greatest degree possible.</p> <p>Natural processes (hydrology, soils, sage prairie, etc.) guide the design of desired new facilities to minimize interference with these processes.</p> <p>Tolerance for resource impacts would be higher than in other zones.</p> <p>Extant cultural resources in this zone would be protected. Existing and new development would avoid or mitigate impacts to the greatest degree possible. The most significant cultural resources in this zone would be the artifacts displayed and protected in the visitor center.</p> <p>The natural soundscape would be protected and enhanced by minimizing the effects of desired vehicles and visitor activity, both within this zone and as these activities affect surrounding zones.</p>	<p>There would be occasional high levels of activity, including group activities, with very high probability of encountering other visitors and NPS staff.</p> <p>Those areas dedicated to monument administration typically would not be accessed by visitors.</p> <p>Visitors would have amenities and services available to welcome them to the monument and support day-use activities. Visitors would feel secure in a developed environment.</p> <p>Formal and structured orientation and education opportunities would be greatest in this area. Providing opportunities for all ages and abilities to learn about monument resources would be a high priority in this zone.</p> <p>Appropriate visitor activities would include walking, picnicking, camping, and educational programs.</p> <p>This zone provides a high level of predictability and requires little preparation by the visitor; only a short time commitment is needed to experience this zone.</p>	<p>This zone includes concentrated areas of development. Noncontributing elements are apparent, but such additions are carefully designed and placed to complement the character of adjacent zones.</p> <p>Visitor service facilities appropriate for this zone could include visitor centers, fee stations, comfort stations, book sales, picnic areas, roads, parking lots, accessible trails, and education facilities. Regulatory and interpretive signs would be common.</p> <p>Park administration facilities appropriate in this zone would include headquarters, maintenance areas, housing areas, and other facilities necessary for the management of the monument.</p> <p>Management actions would be focused primarily on safety issues and visitor experience.</p>

Zone Prescription	Resource Condition	Visitor Use and Experience	Character and Level of Development/Management Activities
<p>Canyon and Mesa</p> <p>Visitors would encounter a cultural and natural scene reminiscent of what the first 19th century explorers to Hovenweep would have experienced. Close contact with the monument's cultural and natural resources would provide opportunities for visitors to learn about the monument through self-discovery and exploration.</p>	<p>In this zone, presentation and protection of cultural landscape would be a staff priority. Manipulation of natural resources, (e.g., removal of vegetation) would be allowed to protect cultural resources enhance interpretation.</p> <p>Properties listed in the national register or determined to be eligible for listing are preserved or rehabilitated. Modifications of cultural landscape elements would be limited to requirements for health and safety, and resource protection.</p> <p>Tolerance for resource impact relating to visitor use and development would be low.</p> <p>Periodic, low-intensity noise intrusions coming from outside the zone (e.g., vehicle noise), as well as low-intensity noise intrusions originating within the zone, such as human voices would be minimized by scheduling deliveries and heavy equipment operations for periods of low visitor use and managing visitor programming to minimize noise issues.</p>	<p>There would be a moderate level of activity; visitors would have a moderate probability of encountering other visitors and NPS staff.</p> <p>Appropriate visitor activities would include walking on designated trails, photography, resource research and education, natural and cultural resource observation, and sightseeing.</p> <p>This zone would provide a sense of challenge and adventure; a moderate time commitment (2–4 hours) would be needed to experience this zone.</p> <p>Preserving the integrity of the scenic quality related to the prehistoric cultural landscape would be a priority in this zone.</p>	<p>There would be a low level of development. The character would be less formal and less apparent than in the Operations and Visitor Services zone.</p> <p>Facilities appropriate for this prescription would include natural surface trails and unobtrusive interpretive signs. Trail appearance would reflect conditions compatible with the landscapes created by the ancestral Pueblo people to as great a degree as possible.</p> <p>Improvements to facilitate interpretation and ensure visitor and staff safety would be small in scale and designed to blend with the environment.</p> <p>Management actions would be focused primarily on resource protection and visitor experience.</p>

Zone Prescription	Resource Condition	Visitor Use and Experience	Character and Level of Development/Management Activities
<p>Four Corners Exploration</p> <p>Visitors in this area would have opportunities to experience the distinct natural features and solitude of the southwest desert environment.</p>	<p>Natural resources and processes would dominate this area. Disturbance of natural processes would be uncommon and on a small scale (e.g., channeling along trails to direct runoff).</p> <p>Resources listed in the national register or determined to be eligible for listing would be preserved or stabilized, using methods that do not impact natural resource conditions.</p> <p>Adverse impacts would be allowed only in case of requirements for health and safety.</p> <p>Natural resource restoration activities to correct past impacts would be allowed.</p> <p>There would be periodic, low-intensity noise intrusions coming from outside the zone (e.g., vehicle noise), but noise intrusions originating within the zone, such as human voices, would be uncommon.</p> <p>This area would not contain the park's most significant cultural resources; however, it would reflect the prehistoric and historic landscape and natural setting.</p>	<p>There would be a low level of visitor activity in the area.</p> <p>Access would be self-directed on designated trails.</p> <p>Appropriate visitor activities would include hiking, wildlife watching, and nature observation.</p> <p>This zone would provide a moderate to high level of challenge and adventure: a moderate time commitment would be required to experience this zone.</p> <p>Natural sounds and scenic quality would be important to the zone.</p>	<p>There would be minimal interpretive media to assist visitors in a self-guiding experience.</p> <p>There would be minimal development, such as designated, unpaved trails and directional signs.</p> <p>Connections to regional trails and trails to other monument units through adjacent public lands would be considered and accommodated where possible in this zone.</p> <p>Management actions would be focused primarily on resource protection, with some emphasis on visitor experience.</p>

Zone Prescription	Resource Condition	Visitor Use and Experience	Character and Level of Development/Management Activities
<p>Sensitive Resources</p> <p>This zone would protect the park's most sensitive and vulnerable resources. Resource preservation would be the overarching management goal.</p>	<p>The protection of highly sensitive or at-risk natural and cultural resources would be the management focus of the area.</p> <p>Resource protection would take precedence over visitor use.</p> <p>Natural sounds would predominate; intrusions would be rare, of low intensity and duration, and would occur mainly from outside the zone (e.g., noise from vehicles).</p> <p>Properties listed in the national register or determined to be eligible for listing would be conserved, protected, and managed to prevent the impairment of archeological resources or their values. This management would be accomplished through a systematic program of activities for the identification, evaluation, documentation, registration, treatment, protection, preservation, monitoring, research, and interpretation of these resources.</p>	<p>This area would be closed to visitors, owing to the sensitivity of resources; or access could be provided on a reservation, guided-tour basis. If access were permitted, a moderate to high time commitment would be needed to access and experience this zone, depending on the activity.</p> <p>Primarily, this area would be interpreted indirectly in other areas of the monument that would be open to the public.</p> <p>Natural sounds and scenic quality would be important to this zone.</p>	<p>This area would have no development for visitor use or monument operations.</p> <p>Management actions would be focused primarily on resource protection, with some emphasis on safety issues.</p> <p>Research activities for resource inventory and monitoring would be allowed.</p>

ALTERNATIVE A: NO ACTION — CONTINUE CURRENT MANAGEMENT

This alternative would continue the current management of the monument, guided by the enabling legislation, existing planning documents, and other management data.

RESOURCE CONDITION

Park management would continue preserving and protecting the ruins located at the six units that make up Hovenweep National Monument, placing special emphasis on conserving the unique, standing prehistoric structures. Ruin wall stabilization at Cajon and Cutthroat Castle units would continue, as would stabilization of prehistoric architecture at other units. Restoration of disturbed sites and reestablishing historic vegetation monitoring plots would continue, as would hydrological studies at Square Tower unit. The monument would continue to cooperate with the Bureau of Land Management's Anasazi Heritage Center for the protection and management of Hovenweep's museum collection. The ranger staff of Hovenweep National Monument and Natural Bridges National Monument would continue to provide protection for the monument's archeological sites. Monument management and staff would continue to cooperate with their counterparts at the Bureau of Land Management on collections management, resource protection, trail maintenance, and law enforcement.

VISITOR EXPERIENCE

The monument's management and staff would also continue to provide opportunities for visitors to understand and appreciate the architectural achievements of the ancestral Pueblo people and their cultural adaptation to the demanding high desert environment. Ranger led programs at the Square Tower unit. Visitors would have limited opportunities for self-guided exploration of

the monument's outlying units. The *Visitor Center Interpretive Plan* and subsequent *Long-Range Interpretive Plan* would continue to guide the development of interpretive and educational programs that fulfill the monument's purpose, help visitors understand and appreciate the monument's significance and achieve the other visitor experience goals previously identified.

FACILITIES AND DEVELOPMENT

There would be no new facilities development under this alternative. Existing facilities would continue to be used and maintained in accordance with their current functions.

MANAGEMENT ZONES

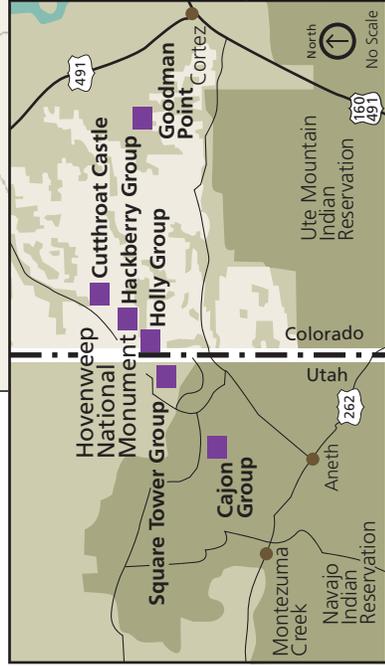
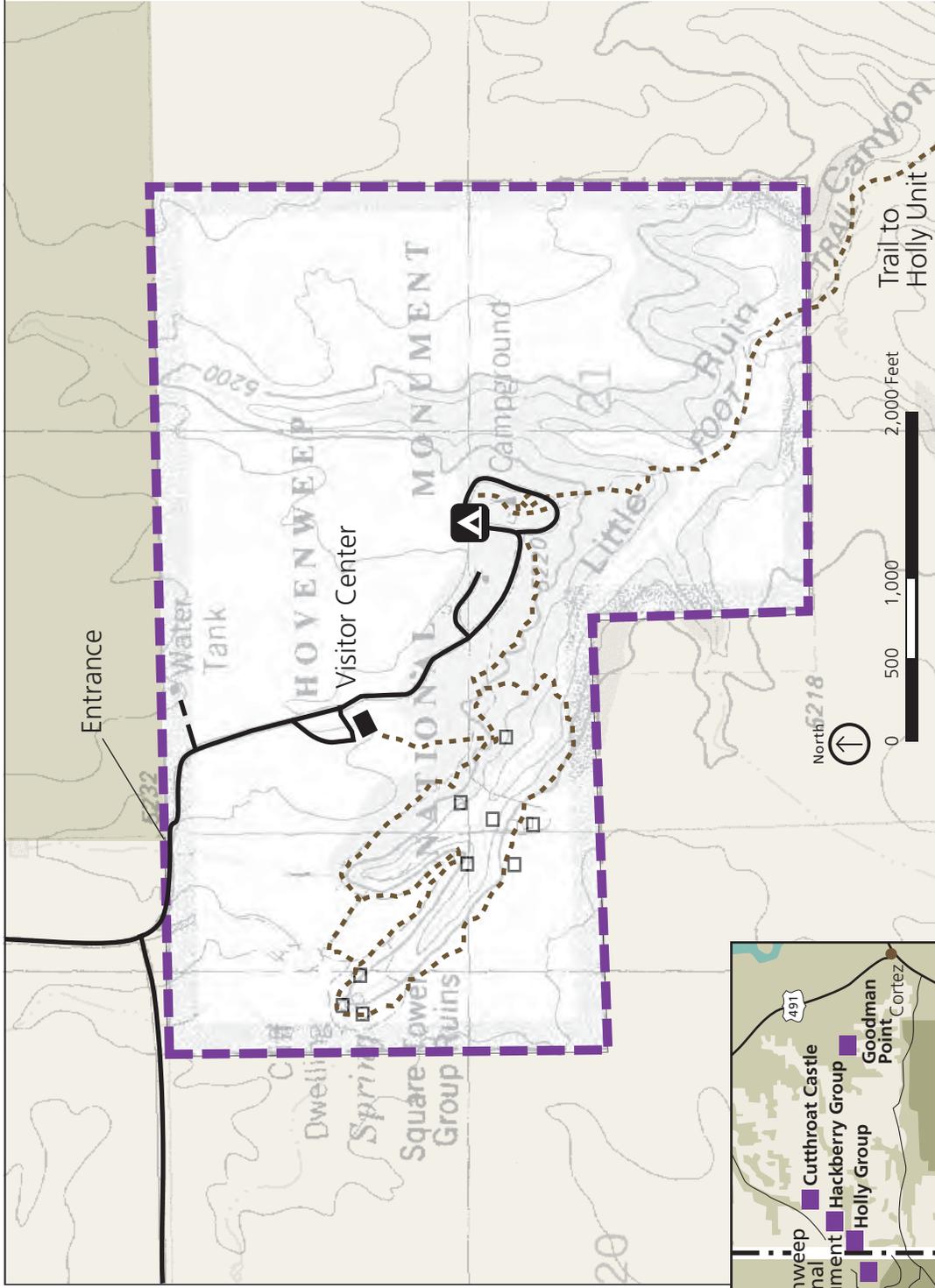
The management zones would not be applied under this alternative.

ESTIMATED COSTS

Table 4: Estimated Costs of Alternative A

Costs	
Annual Operating Costs (ONPS) ²	\$550,000
Staffing (FTE)	5.5
Facility Costs	100,000
Non-facility Costs	50,000
Total one-time costs	\$700,000

² ONPS means "Operations, National Park Service. FTE is "full-time equivalent, or 2080 labor hours in one year. Operating costs would include maintenance of all infrastructure including buildings, campground and amphitheater installations, roads, and trails; utility systems including water treatment and delivery, waste disposal, propane lines, and supporting fuel and utility charges; vehicle costs; program development, publications, and other public visitor services; and staffing overhead including payroll and benefits.

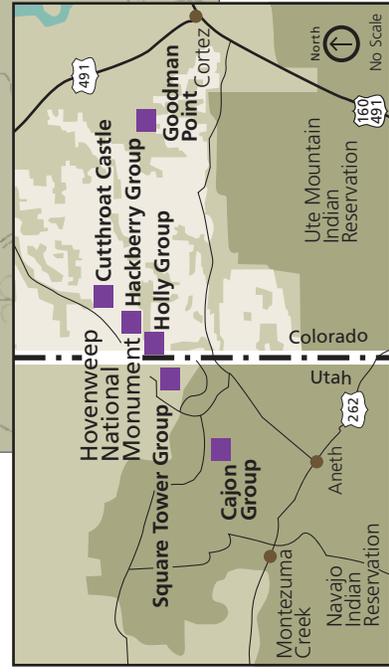
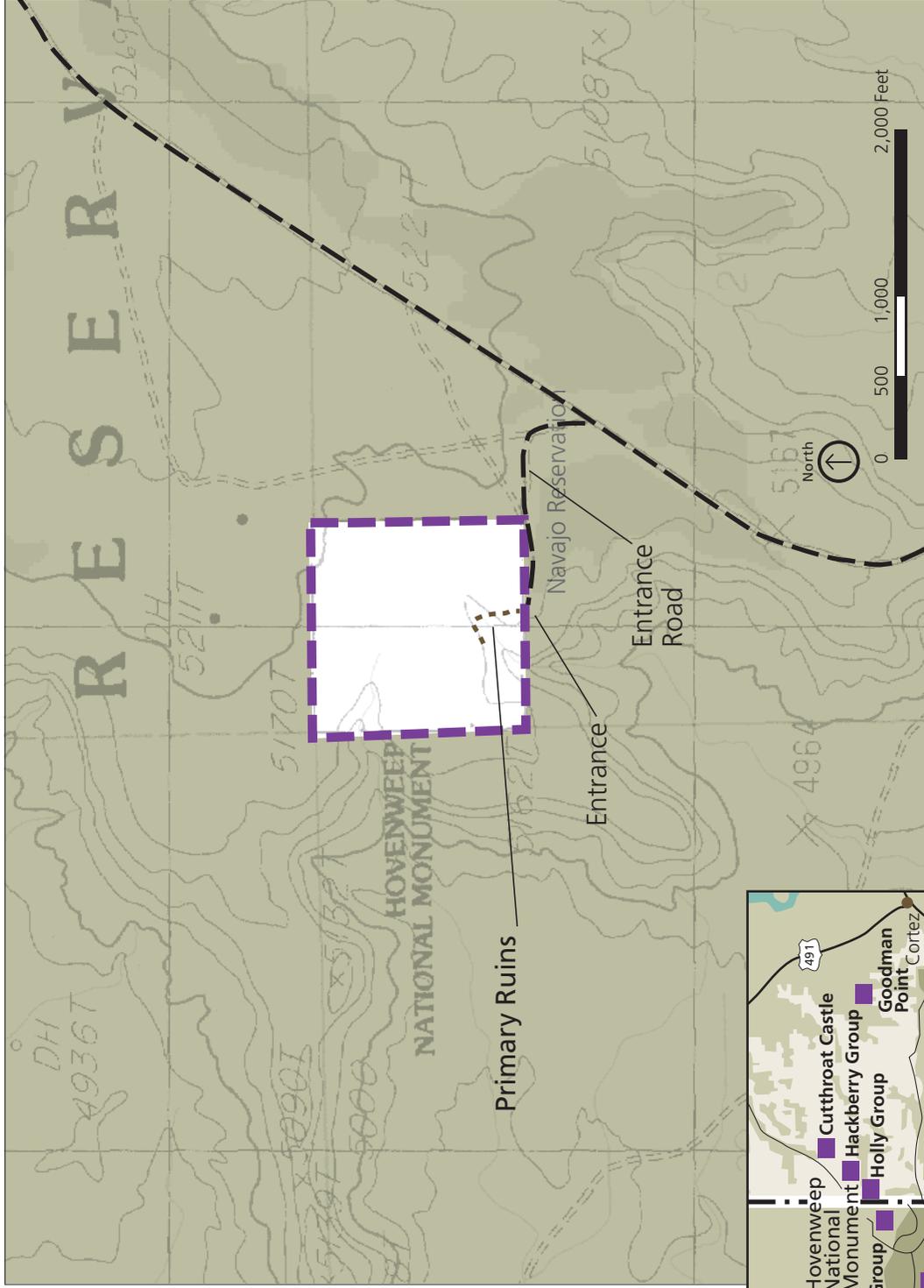


- Ruins
- Paved Road
- Dirt Road
- Trail
- Unit Boundary
- BLM
- State (Utah) Land

NO ACTION
Square Tower Unit
Hovenweep National Monument

Colorado – Utah
 U.S. Department of the Interior / National Park Service
 DSC / May 2009 / 320 / 20002

- Hovenweep National Monument Unit
- Indian Reservation
- National Forest
- Canyons of the Ancients National Monument

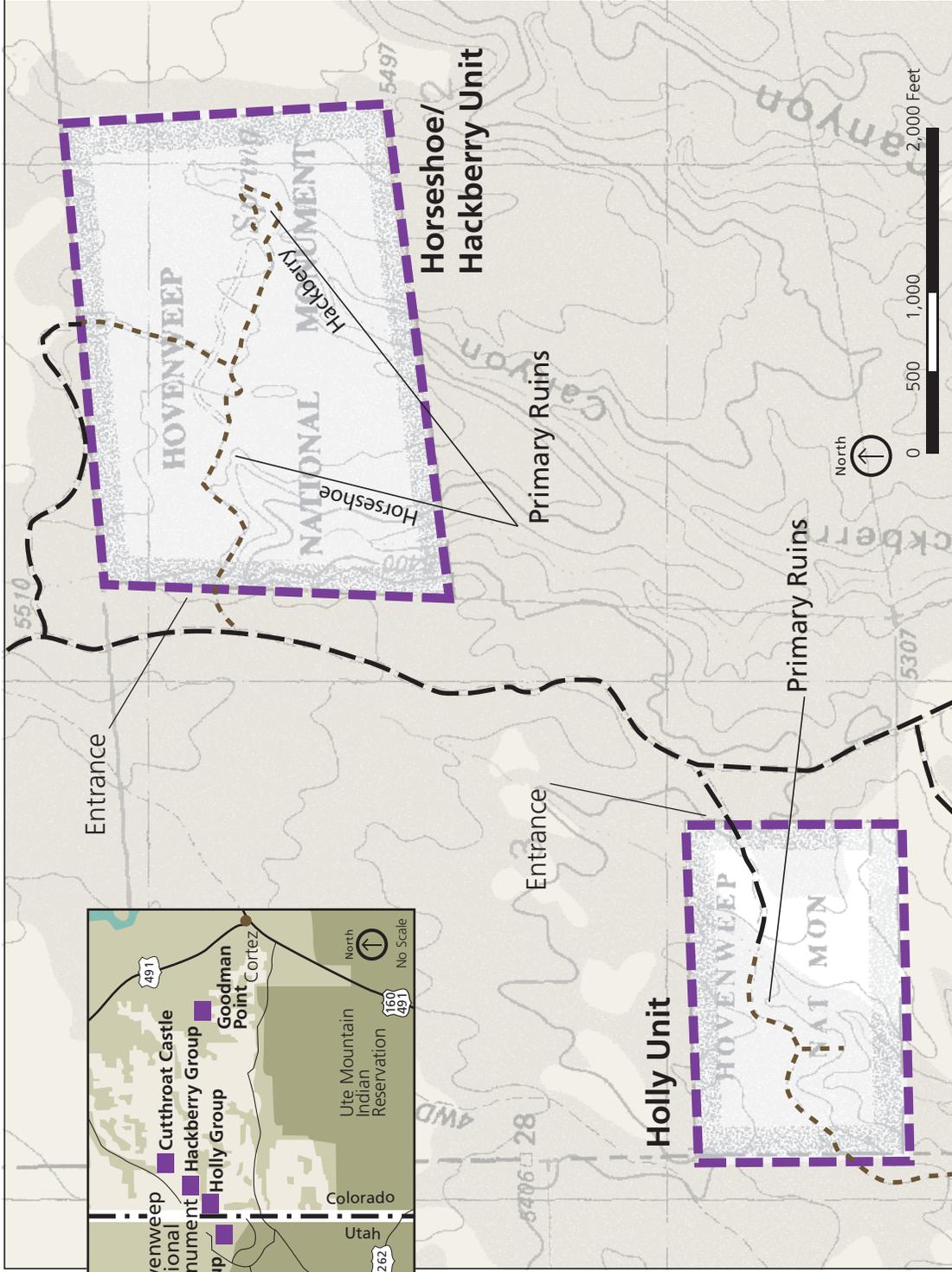


NO ACTION
Cajon Unit
Hovenweep National Monument
 Colorado – Utah

Paved Road
 Dirt Road
 Trail
 Unit Boundary
 Navajo Reservation

Canyons of the Ancients
 National Monument
 Hovenweep National Monument Unit
 Indian Reservation
 National Forest

U.S. Department of the Interior / National Park Service
 DSC / May 2009 / 320 / 20004



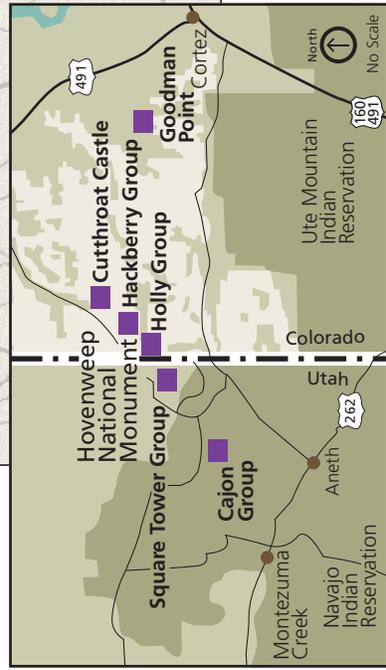
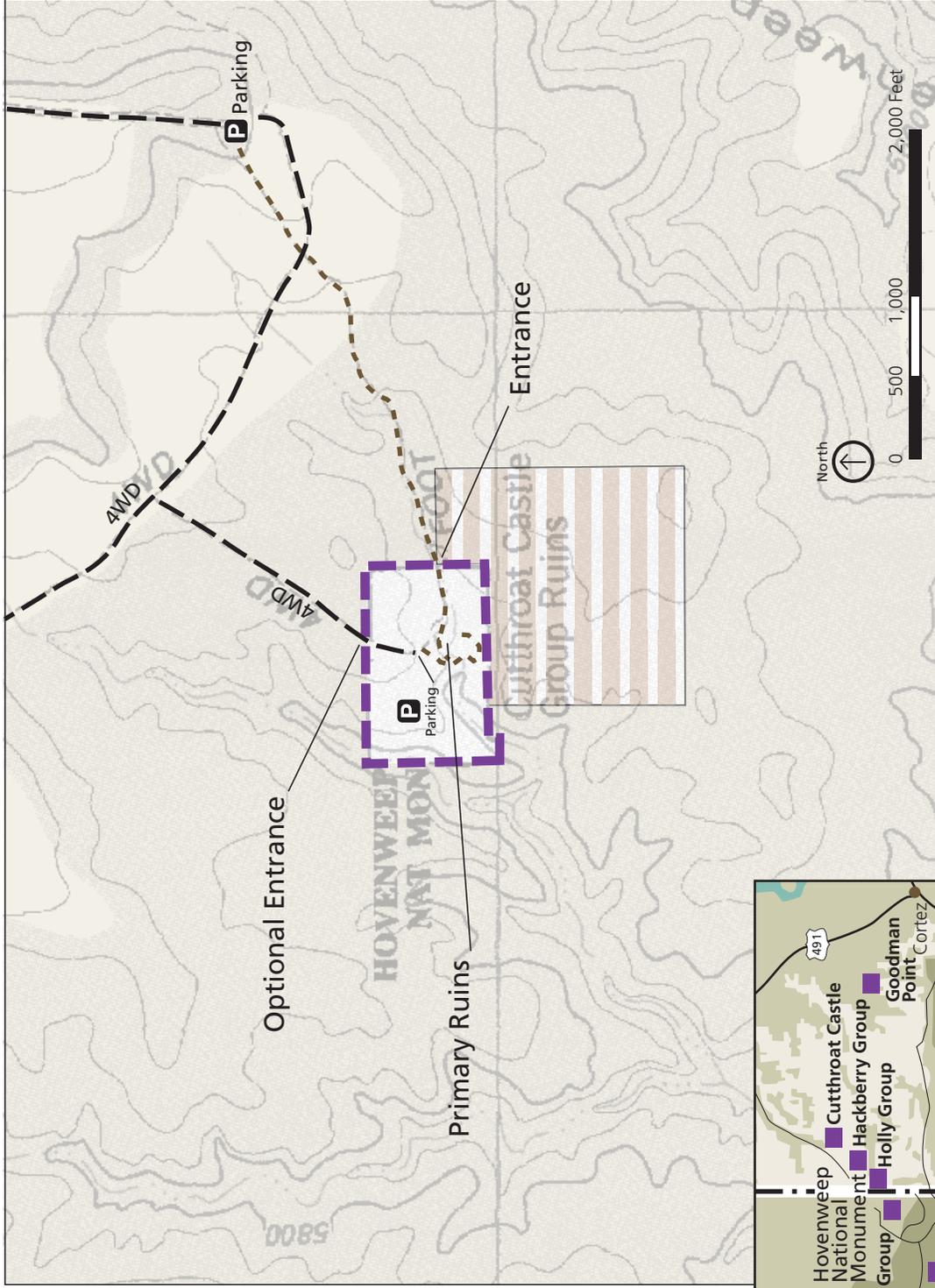
NO ACTION

Holly and Horseshoe/Hackberry Units

Hovenweep National Monument

Colorado – Utah
 U.S. Department of the Interior / National Park Service
 DSC / May 2009 / 320 / 20006

- Paved Road
- Dirt Road
- Trail
- Unit Boundary
- BLM (Canyons of the Ancients National Monument)



- Paved Road
- Dirt Road
- Trail
- Unit Boundary
- Private Ownership
- BLM (Canyons of the Ancients National Monument)

- Hovenweep National Monument Unit
- Indian Reservation
- National Forest
- Canyons of the Ancients National Monument

NO ACTION

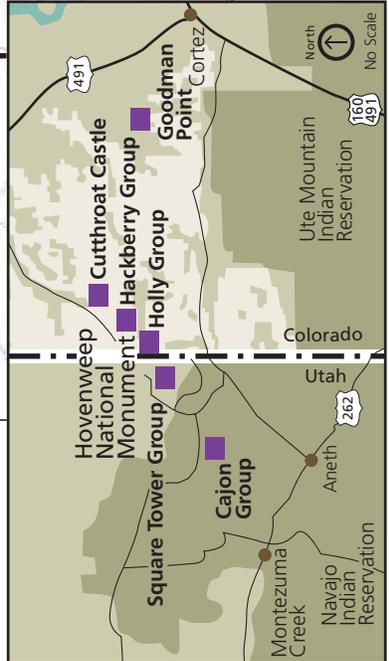
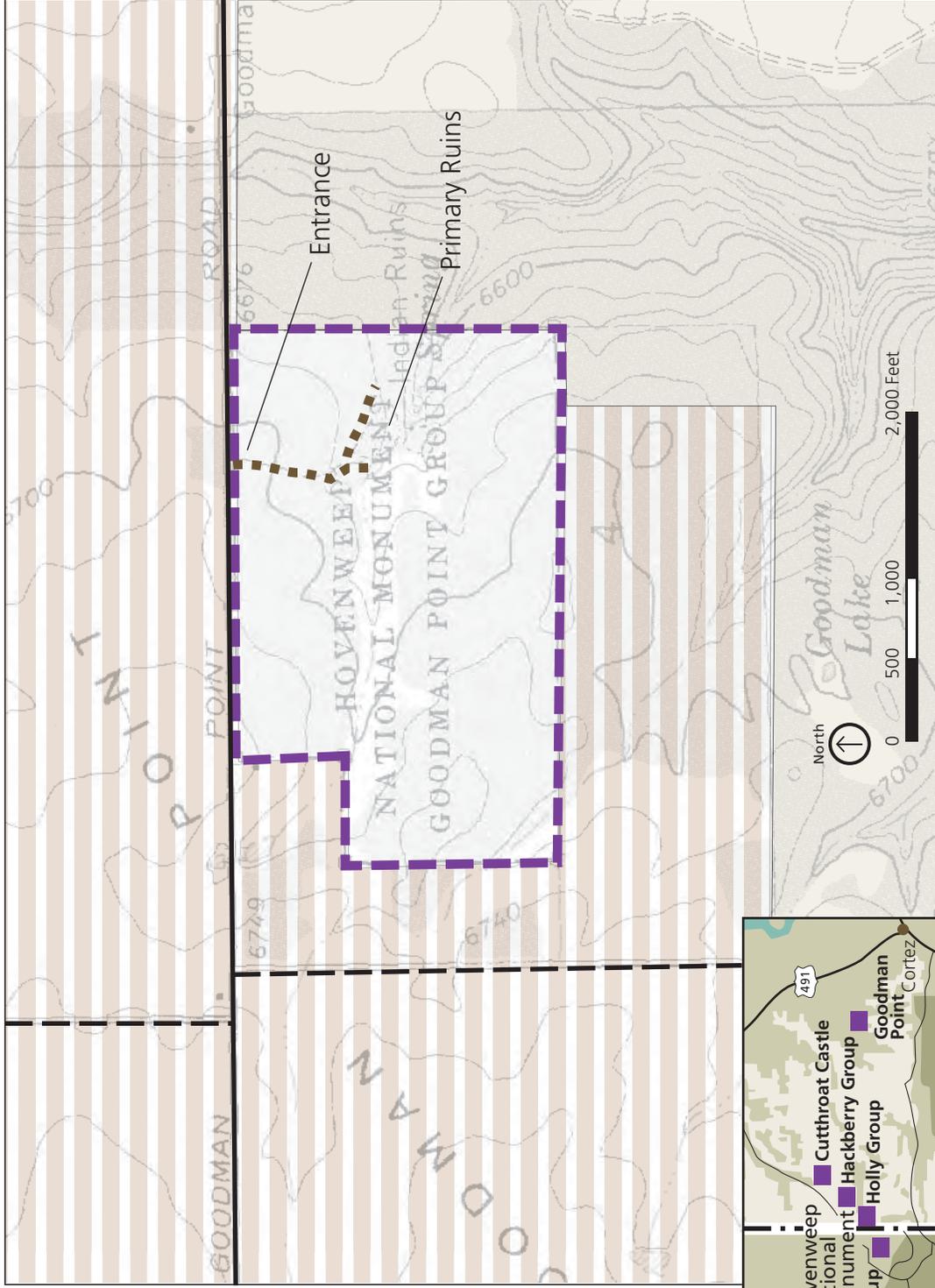
Cutthroat Castle Unit

Hovenweep National Monument

Colorado – Utah

U.S. Department of the Interior / National Park Service

DSC / May 2009 / 320 / 20005



- Paved Road
- Dirt Road
- Trail
- Unit Boundary
- Private Ownership
- BLM (Canyons of the Ancients National Monument)

NO ACTION

Goodman Point Unit

Hovenweep National Monument

Colorado – Utah
 U.S. Department of the Interior / National Park Service
 DSC / May 2009 / 320 / 20003

ALTERNATIVE B: PREFERRED ALTERNATIVE

Management under alternative B would focus on preserving the resources and the remote and primitive character of Hovenweep National Monument. Visitors would have opportunities to explore the resources and landscape of the monument while experiencing feelings of remoteness, solitude, and timelessness—fundamental qualities of the Hovenweep experience.

RESOURCE PRESERVATION

Cultural Resources

Cultural resource preservation efforts would focus on preserving the structures and archeological sites for which Hovenweep was set aside as a unit of the national park system. These resources are important components of the cultural landscapes that evolved during the ancestral Pueblo occupation of the region. This management strategy would focus on maintaining an environment resembling that encountered by the first modern explorers who entered the lands of Hovenweep in the late 19th century. Resource protection strategies would focus on preserving resources within the context of the overall cultural landscape. Under the preferred alternative, cultural landscape reports would be developed for the units of Hovenweep. Monument staff would work with NPS Southeast Utah Group³ and Intermountain Region staff to establish priorities for cultural landscape evaluation and analysis.

The National Park Service would also cooperate with other federal and state agencies in evaluating cultural landscapes that transcend jurisdictional boundaries and developing protection and interpretive strategies for these resources.

Resource protection would be enhanced by limited, conservation-oriented archeological research that would provide monument staff and other NPS professionals with a better understanding of the monument's resource base and help guide future resource protection.

It is NPS policy to ensure that archeological resources under its stewardship are conserved, protected, and managed to prevent the impairment of archeological resources or their values. Conservation archeology considers archeological sites to be nonrenewable resources valuable to society. It is use-oriented in that it justifies protecting and managing sites because of the values that society can obtain from them. By providing information about past cultures and environments, these sites can help inform both researchers and the public.

Because these resources are nonrenewable, conservation archeology promotes frugality in uses such as excavation, but recognizes that providing new information is a primary social benefit of archeology and therefore must be a primary goal of resource management. Archeological resources must be protected and managed so that they can provide an optimal yield of information that contributes to interpretive and educational programs and other public benefits over the long term. Because the primary threats to archeological resources come not from research or other public uses but from development, looting, vandalism, and the forces of nature, conservation archeologists invest much effort in promoting protective legislation, educating the public, and involving the discipline early in the planning of construction projects.

In short, the goals of conservation archeology dovetail well with those of ecosystem management, and conservation archeology offers much to public education as well.

³ The NPS Southeast Utah Group consists of Hovenweep National Monument, Natural Bridges National Monument, Arches National Park, and Canyonlands National Park.

In addition to informing resource protection decisions, the conservation archeology under this alternative would also answer many questions about the lives of the ancestral Pueblo people. These involve such topics as population densities, cultural interactions, migration patterns, the extent of trade networks, and the long-term environmental impacts of their development of the region. Visitors to Hovenweep have raised many questions relating to these topics. Answers to these questions would greatly enrich the visitor experience at the monument.

All conservation archeological research efforts would be undertaken only at the request of the National Park Service and would be guided by protocols provided by NPS archeologists and cultural resource specialists.

The National Park Service would also conduct archeological and cultural resource surveys for the Holly, Horseshoe/Hackberry, Cajon, and Cutthroat units. This would enhance understanding of park cultural resources and enable monument staff to better manage, protect, preserve, and interpret resources and integrate the Hovenweep story into a broader regional context.

Any additions to the park collection resulting from these archeological surveys would be catalogued and stored at the Anasazi Heritage Center and could be used to enhance interpretive programs at the Square Tower visitor center.

Numerous prehistoric standing structures, including towers and walls, archeological sites, and other culture resources, are at risk of deterioration. An expanded program of resource stabilization would be undertaken guided by the *Secretary of the Interior's Standards for Treatment of Historic Properties*. Monument staff would focus on maintaining and preserving the standing architecture of Hovenweep to protect long-term structural

integrity. This would be achieved through a program of cyclic maintenance (stabilization) to ensure that all structures at the monument are in a stable, sustainable condition. Archeologists from the monument and the Southeast Utah Group would establish a comprehensive priority list for the stabilization of at-risk prehistoric structures and sites in the monument.

The creation of a seasonal law enforcement position would provide additional protection from theft and vandalism for monument resources. Partnerships with the Bureau of Land Management, Navajo Nation, and state and local jurisdictions would also enhance protection of the monument's resources.

Natural Resources

Critical natural resources at Hovenweep include hydrology, riparian systems, and the ambient qualities of the natural landscape (i.e., viewshed, night sky, soundscape).

Monument staff would implement studies to ascertain a complete understanding of hydrological processes in all Hovenweep units, determine effects from outside development on hydrological resources, and work to protect and maintain properly functioning riparian ecosystems wherever they are present in Hovenweep. Riparian communities found in the heads of canyons and often associated with natural springs would be protected by placing them in the Sensitive Resources zone, which limits public access. Inventory and monitoring efforts would continue in these sensitive areas.

Monument staff would also work to ensure that viewsheds, night sky, and soundscapes are preserved by implementing the guidelines shown in table 5, and work in partnership with others to protect those resources outside the park boundary.

Table 5: Viewshed Protection Tools

COMPATIBLE TYPES OF DEVELOPMENT		EXAMPLES	POSSIBLE TOOLS
Foreground (line of sight up to 2 miles from viewpoint)	Small-scale developments	Trails, signs, benches, water spigots, wire fences.	<ul style="list-style-type: none"> • low-profile signs • winding trails
Middleground (2 to 5 miles away)	The above plus medium-scale developments or temporary large-scale developments	Small structures, campgrounds, picnic areas, local utility lines, dirt roads, low-profile storage tanks, temporary drilling rigs, drilling pads, vegetation treatments	<ul style="list-style-type: none"> • use vegetative screening • paint structures with landscape-neutral colors • stipulate nonspecular utility lines
Background (more than 5 miles away)	All the above plus large-scale, permanent developments	Radio towers, major powerlines, paved roads, golf courses, storage tanks, landscape manipulation (e.g. tree chaining or leveling for agriculture)	<ul style="list-style-type: none"> • locate large structures or utility lines off of ridgetops • paint towers and storage tanks a neutral color

NPS management would work with representatives of federal, state, county, and local agencies; non-profit organizations; and neighboring landowners to develop strategies to preserve resources and protect their values. These strategies would serve as the framework for cooperative agreements between the National Park Service and other agencies and organizations. Cooperative agreements are an essential tool for monument management, and are used to enhance collections and resource management, law enforcement, and emergency operations. These agreements bring the National Park Service into closer partnership with counties in Colorado and Utah, the Canyon of the Ancients National Monument (Colorado BLM), the Monticello Field Office (Utah BLM), the Navajo Nation, and local governments.

The National Park Service could also provide private landowners with information about the importance of scenic resources and ways they could assist in protecting them.

The designation of conservation or scenic easements or the acquisition of lands through a supporting third party like the Archeological Conservancy, the Trust for Public Lands, or the Nature Conservancy, would provide additional protection for viewsheds.

Vegetation in undeveloped portions of the monument would be managed to preserve or restore big sagebrush communities and a pre-settlement mosaic of cool season bunch grasses and deep-rooted shrubs. As part of a resource stewardship strategy, an invasive species management plan would be prepared and implemented to give native species opportunity to thrive.

VISITOR EXPERIENCE

The resource condition goals previously described would establish the foundation for the visitor experience at Hovenweep. Management would focus on maintaining and enhancing an environment in which visitors could experience the resources of Hovenweep with a minimum of modern intrusions. Visitors could expect to experience the sense of seclusion that evokes Hovenweep's time of discovery in the late 19th century. This sense of isolation sets Hovenweep apart for visitors.

Visitors would also learn about the daily lives of the Ancestral Pueblo people and the way they adapted to life in this demanding environment. They would come to recognize, understand, and appreciate the existing village patterns, archeological resources, standing structures, and other evidence of the ancestral Pueblo cultural landscape.

Interpretation and Education

Visitors would receive their initial orientation to Hovenweep at the Square Tower visitor center. Here they would learn of the broad historical context of the ancestral Pueblo people, the environmental history of the region, and the ways in which these people interacted with this environment. Following this orientation, visitors would receive information about Square Tower unit and the other monument units. Visitors could then explore these units on their own or on ranger-guided tours. Visitors to the outlying units would be informed of the potential hazards of visiting these remote sites, such as rough roads, extreme climate conditions, lack of water, and the chance of becoming disorientated in unfamiliar territory. These materials would also include information about the sensitive nature of the resources at remote units and the need to observe special care while visiting these sites. Additional information would help visitors recognize the signs of resource degradation, theft, or vandalism, and provide contact information for rangers in the field. This "resource stewardship" information would be

provided in brochures and in the film and interpretive programs at the Square Tower visitor center.

Seasonal special events could be developed to coincide with important events in ancestral Pueblo life, such as planting and harvest time.

Seasonal staff would be used to enhance curriculum-based programs developed under Canyon Country Outdoor Education, part of the Parks as Classrooms program.

Improvements to the monument's trails system would provide additional opportunities for visitors to experience and gain a greater appreciation for and understanding of the natural environment of the Great Sage Plain. Protection of viewsheds, night sky, and soundscapes would also enhance the visitor appreciation of this environment by providing opportunities in most areas of the monument to experience natural sounds and dark night skies. These are critical components of the timeless qualities of Hovenweep, which enable visitors to make emotional connections to life in ancestral Pueblo communities and their relationship to the natural environment. Nighttime interpretive tours of the monument could be developed to enhance visitor understanding and enjoyment of this important monument resource. The use of private guide services could also expand visitor opportunities to see and experience resources in more remote areas of the monument.

Monument staff would also initiate the development of regional visitor use and education plans and for preservation programs in partnership with the Bureau of Land Management (Anasazi Heritage Center, Monticello Field Office, Canyon of the Ancients National Monument), U.S. Forest Service, Edge of the Cedars State Park, Crow Canyon Archaeological Center, and other state, local, and private agencies and organizations. The regional use and education plans would have enormous value in interpreting the lives of the ancestral Pueblo people in a broader regional context. The protection plans would

inform visitors of the important role they can play in resource protection and preservation. The plans would include the development of directional signs and education programs that would provide additional guidance to visitors and would also contribute to the monument's interpretation plan.

Regional patterns of development over the past decade indicate that there is a probability that future land use will introduce modern elements into the views surrounding the Hovenweep units. These modern elements would have a potentially detrimental effect on the visitor experience at the monument. Protection of important vistas from and within the monument units would contribute to the overall visitor experience by helping to preserve the monument's remote and primitive character.

The NPS Organic Act requires park managers to conserve scenery unimpaired for future generations. NPS management policies require park managers to take steps to maintain and protect the inherent integrity of the natural resources, processes, systems, and values of the parks. This includes highly valued associated characteristics, such as scenic views.

Development could affect soundscapes and night sky visibility. The National Park Service is concerned with degradation of natural quiet and light pollution in many units of the national park system. *NPS Management Policies 2006* states that

The National Park Service will strive to preserve the natural quiet and natural sounds associated with the physical and biological resources of the parks. Activities causing excessive or unnecessary unnatural sounds in and adjacent to parks will be monitored, and action will be taken to prevent or minimize unnatural sounds that adversely affect park resources or values or visitors' enjoyment of them.

NPS Director's Order 47 mandates strong consideration of soundscape and noise issues in park planning and management. NPS policy will outline the basic requirements for collecting acoustic data and developing strategies for managing soundscapes.

Increasing residential and commercial development into traditionally rural areas in the Cortez area and other parts of the Central Mesa Verde region, population growth, and increasing development in the Navajo Nation all could affect night sky visibility, which has been identified for Hovenweep as an important natural resource.

The National Park Service would spearhead a partnership of federal, state, and local agencies, monument neighbors, and local communities to develop a protection strategy for all critical vistas, such as those from Square Tower unit and the Goodman Point unit. This protection strategy would ensure that all critical and important views were identified and prioritized; the strategy also would establish protective guidelines and determine the appropriate mechanisms needed to implement those guidelines.

This would help ensure the preservation of these viewsheds—an essential component of the Hovenweep experience—for future generations. The National Park Service has completed a preliminary viewshed analysis to guide this process and establish a baseline for future, more detailed analyses.

FACILITIES AND DEVELOPMENT

Development under this alternative would be minimal, in keeping with the overall objective of maintaining the monument's primitive qualities. A new maintenance facility would be developed at the Square Tower unit about 0.25 mile southeast of the unit entrance and about 0.25 mile northeast of the visitor center. The facility would be located in "Park Operations and Visitor Services" zone. (See the "Preferred Alternative, Square Tower

Unit” map.) This new facility would replace the existing small maintenance shed and other outbuildings. This facility would include some office space for monument maintenance and resources management staff. The new facility would have adequate storage capacity, which would enable monument staff to remove materials stored in the garages at the housing units. The new facility would be unobtrusive on the cultural scene and positioned out of the sight lines from key cultural features and significant viewsheds.

Some small-scale improvement could be made to parking areas and informational signs. Trails would be widened or realigned in selected areas. Vault toilets would be installed at key locations to replace existing pit toilets.

A small, 5- to 6-car, unpaved parking lot would be constructed in the Operations and Services zone of Goodman Point Unit. Vehicle parking for this unit has always been informal, located in the right-of-way of Montezuma County “P” Road. With the recent dramatic increase in use and the imminent paving of the road, this parking pattern is no longer practical or safe. The development of this parking area would enhance visitor and staff safety at Goodman Point.

Minimal additional base-funded staffing is recommended under this alternative. Four seasonal staff positions in the law enforcement, maintenance, resources management, and interpretive operations would be added. This would result in a net increase of two FTE (full-time equivalent) over Alternative A.

Commercial Use Authorization

The park could utilize private guide services to escort visitors and provide interpretation for resources in the Sensitive Resources zone. This could assist the park in management visitor use and experience at Goodman Point, most of which is included in this zone.

The operations of guide services to supplement ranger-guided tours would be

governed through a commercial use authorization. This permit authorizes suitable commercial services to park areas under limited circumstances. These include services that (1) are determined to be an appropriate use of the park; (2) will have minimal impact on park resources and values; and (3) are consistent with the purpose for which the unit was established. Such services would not require the construction of any structure, fixture, or improvements within the boundaries of the monument or on any federal land.

There would be no need for commercial facilities or other large-scale commercial services for public enjoyment of the national monument. Therefore, a commercial visitor services plan would not be required for the monument. Any commercial uses would be addressed through the commercial use authorization.

PARK UNITS AND MANAGEMENT ZONES

Under this alternative, the management zones described in the “Management Zones” section near the beginning of this chapter would be applied to the six units of Hovenweep. Most of the land of Hovenweep would be included in the Four Corners Exploration zone, in order to preserve the sense of isolation and solitude characteristic of the central Mesa Verde region.

Square Tower Unit

At Square Tower unit (400 acres), approximately 280 acres would be zoned Four Corners Exploration. Approximately 80 acres would be included in the Canyon and Mesa zone and approximately 40 acres in the Operations and Visitor Services zone.

Goodman Point Unit

At Goodman Point (142 acres), approximately 125 acres would be included in the Sensitive Resources zone. Approximately 15 acres would be included in the Four Corners

Exploration zone, and less than 1 acre in the Operations and Visitor Services zone.

Cajon Unit

At Cajon (40 acres), approximately 35 acres would be included in the Four Corners Exploration zone. Approximately 5 acres would be included in the Canyon and Mesa zone.

Cutthroat Castle Unit

At Cutthroat Castle (14 acres), approximately 12 acres would be included in the Four Corners Exploration zone and 2 acres in the Canyon and Mesa zone.

Horseshoe/Hackberry Unit

At Horseshoe/Hackberry (126 acres), approximately 110 acres would be included in the Four Corners Exploration zone, approximately 15 acres in the Sensitive Resources zone, and less than one acre in the Operations and Visitor Services zone.

Holly Unit

At Holly (63 acres), approximately 50 acres would be included in the Four Corners Exploration zone, approximately 13 acres in the Canyon and Mesa zone, and less than 1 acre in the Operations and Visitor Services zone.

BOUNDARY ADJUSTMENT

Should future research identify resources that are potentially critical to Hovenweep’s purpose and significance, the National Park Service would prepare an amendment to this general management plan to consider a range of alternatives for the management and protection of these resources. These alternatives could include a proposal to expand the monument’s boundaries to provide additional protection for these critical resources. Please see the “Boundary Adjustment” discussion in chapter 1 for more information on this topic.

The costs for alternative B include the costs for the new maintenance facility described in the “Facilities and Development” section. These costs are based on a preliminary estimate developed by monument maintenance staff in 2007, and adjusted for 2010 dollars. This estimate included construction of a new 2,000-square-foot prefabricated building, utility installation, heating and ventilation systems, communications systems, and demolition of existing facilities.

ESTIMATED COSTS

Table 6: Estimated Costs of Alternative B

Costs	
Annual Operating Costs (ONPS) ⁴	\$800,000
Staffing (FTE)	7.5
Non-facility Costs (include funds for HSRs, CLRs, archeological surveys, and other research needs)	\$850,000
Facility Costs	\$500,000
Total One-Time Costs	1,350,000

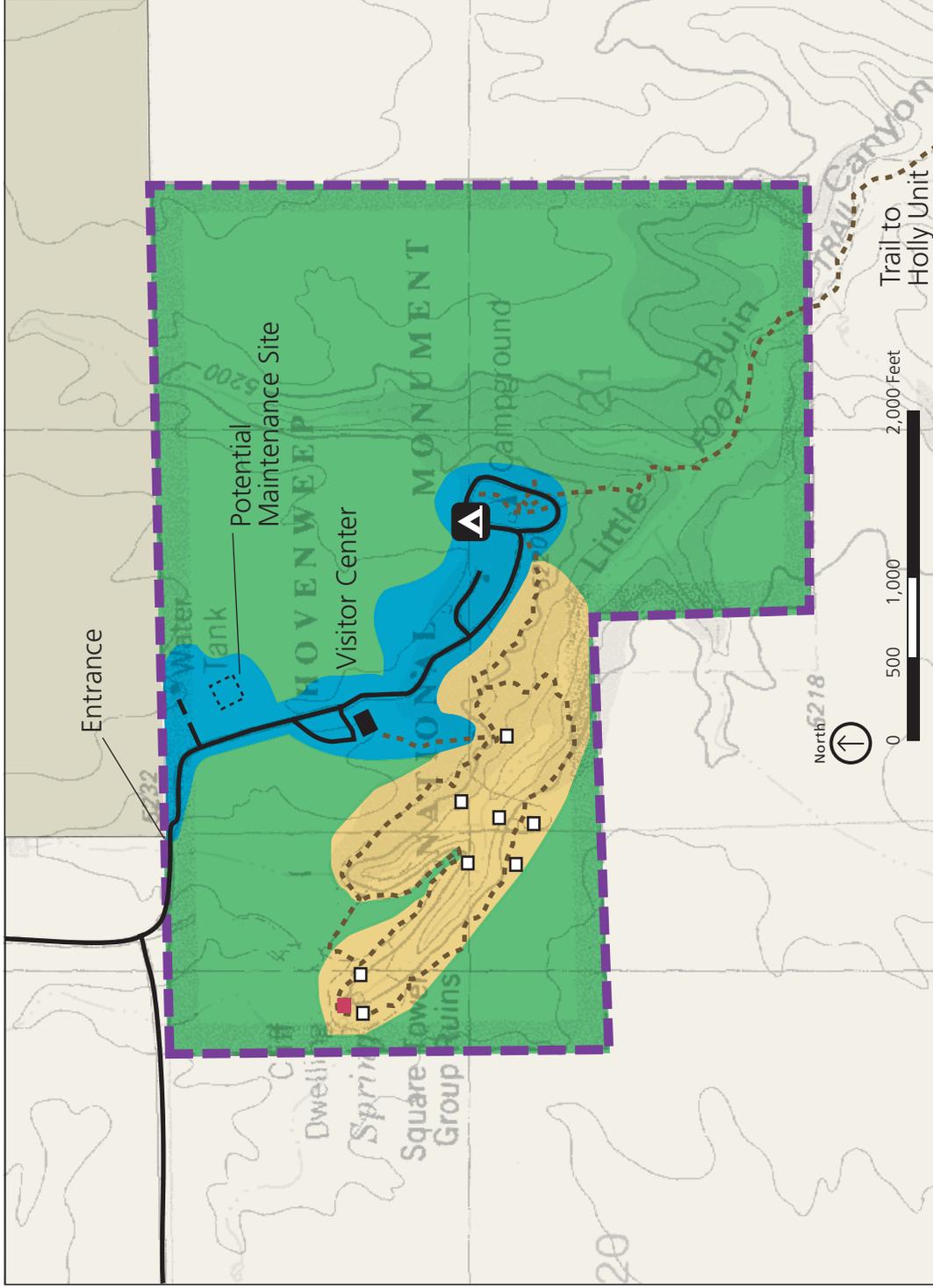
Non-facility costs would include costs for future studies, including an administrative history, archeological surveys, historic structures reports, a culture landscape report, and a resource stewardship plan. The costs associated with these studies and plans would be spread over the life of the general management plan.

⁴ ONPS means “Operations, National Park Service. FTE is “full-time equivalent, or 2,080 labor hours in one year. Operating costs would include maintenance of all infrastructure including buildings, campground and amphitheater installations, roads, and trails; utility systems including water treatment and delivery, waste disposal, propane lines, and supporting fuel and utility charges; vehicle costs; program development, publications, and other public visitor services; and staffing overhead including payroll and benefits.

AGENCY PREFERRED ALTERNATIVE

Alternative B is the alternative preferred by the National Park Service because it better meets the monument's purposes, needs, and objectives compared with the no-action alternative. This alternative provides additional protection for the cultural and

natural resources of the monument, expands the range of visitor experiences, and enhances the park's outreach and partnership programs. Alternative B would have beneficial impacts on the visitor experience, interpretive programs, cultural and natural resources, and monument operations.



Management Zones

- Park Operations & Visitor Services
- Canyon & Mesa
- Four Corners Exploration
- Sensitive Resources

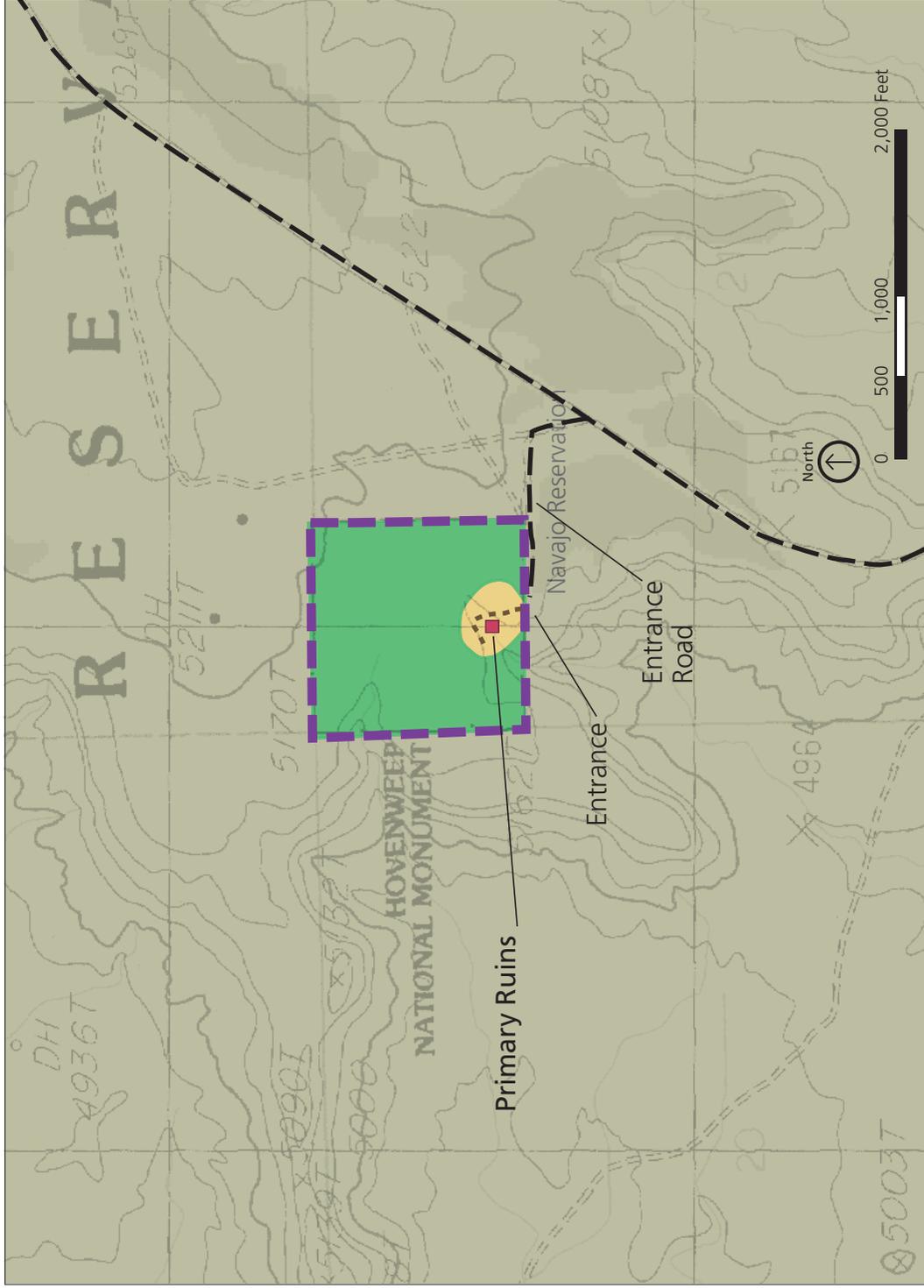
- Ruins
- Paved Road
- Dirt Road
- Trail
- Unit Boundary

- BLM
- State (Utah) Land

**PREFERRED
ALTERNATIVE**

**Square Tower Unit
Hovenweep National Monument**

Colorado – Utah
U.S. Department of the Interior / National Park Service
DSC / May 2009 / 320 / 20007



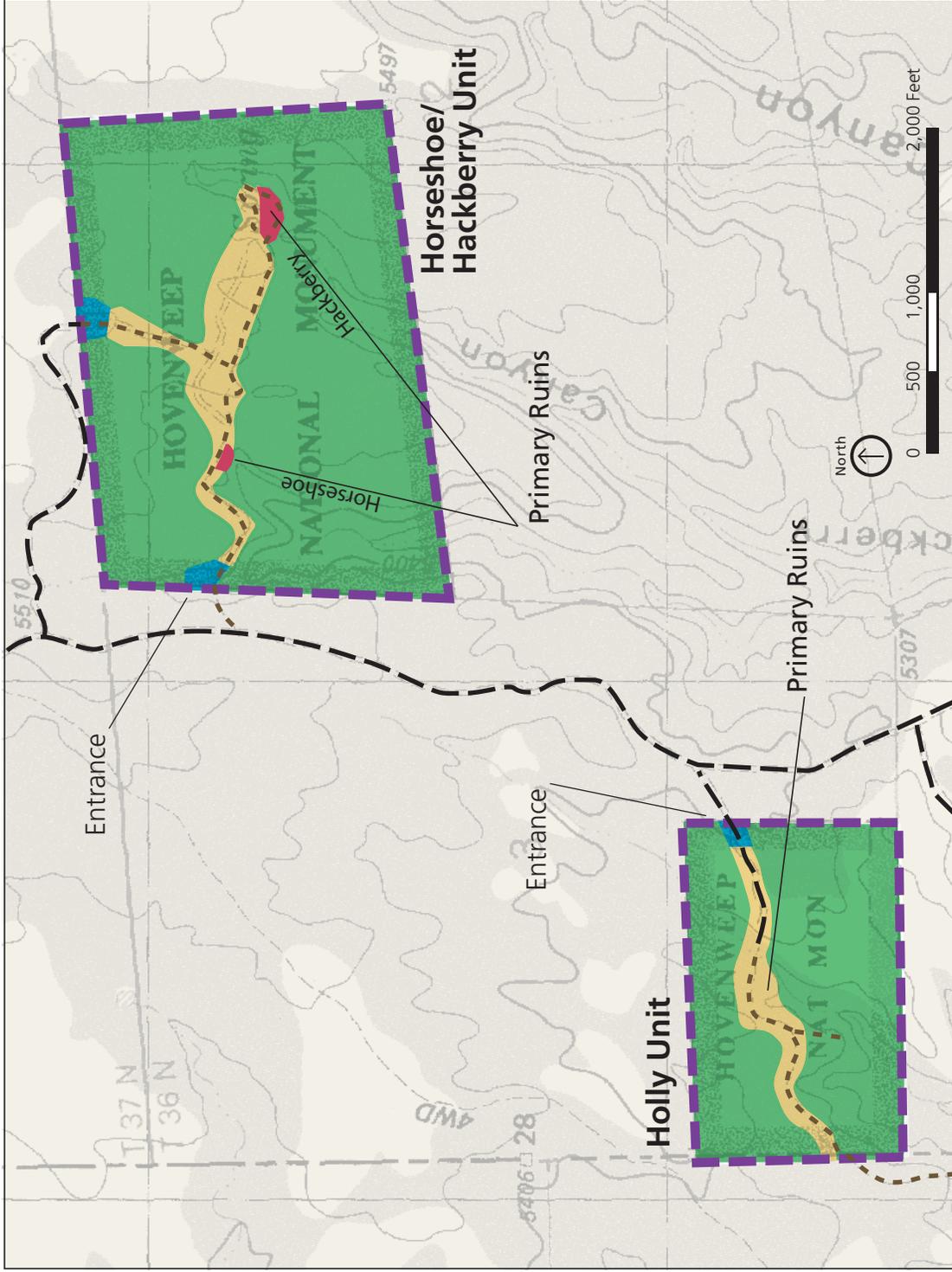
Management Zones

- Park Operations & Visitor Services
- Canyon & Mesa
- Four Corner Exploration
- Sensitive Resources

- Paved Road
- Dirt Road
- Trail
- Unit Boundary
- Navajo Reservation

**PREFERRED ALTERNATIVE
Cajon Unit
Hovenweep National Monument**

Colorado – Utah
 U.S. Department of the Interior / National Park Service
 DSC / May 2009 / 320 / 20009



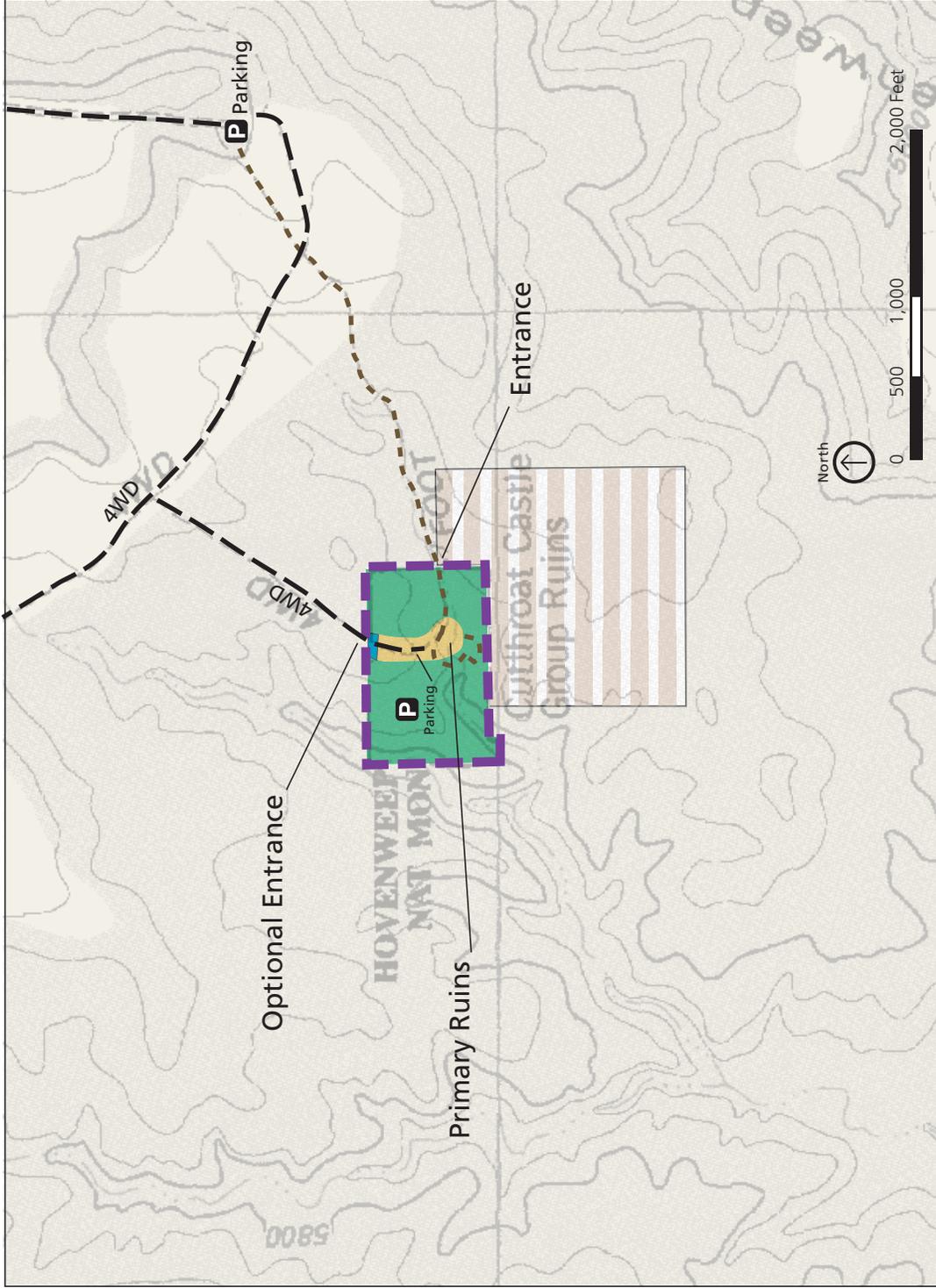
PREFERRED ALTERNATIVE

Holly and Horseshoe/Hackberry Units

Hovenweep National Monument

Colorado – Utah
 U.S. Department of the Interior / National Park Service
 DSC / May 2009 / 320 / 20011

- | | | | | | |
|---|------------------------------------|---|---------------|---|---|
|  | Park Operations & Visitor Services |  | Canyon & Mesa |  | Sensitive Resources |
|  | Four Corners Exploration |  | Unit Boundary |  | BLM (Canyons of the Ancients National Monument) |
|  | Paved Road |  | Dirt Road |  | Trail |



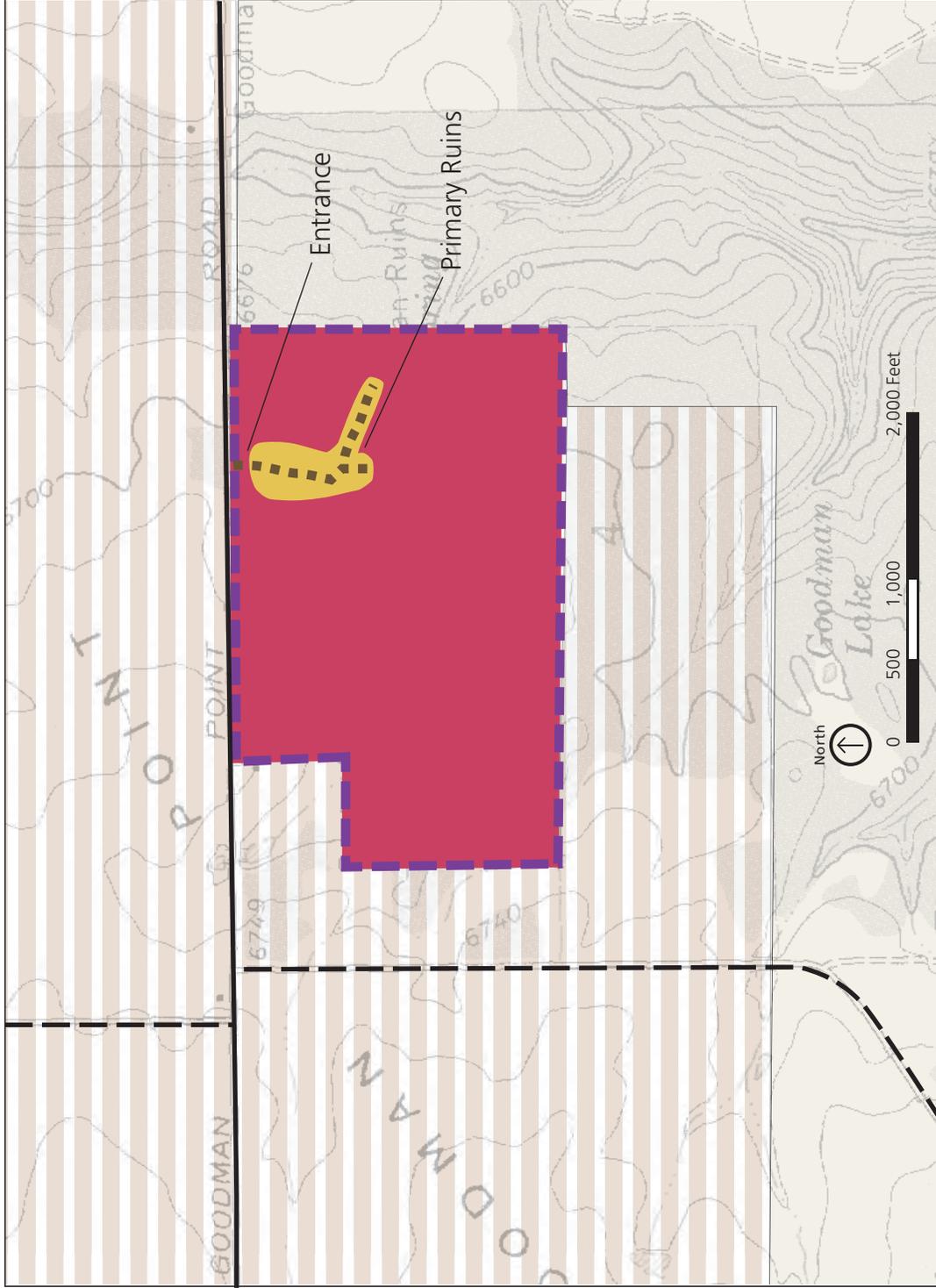
Management Zones

- Park Operations & Visitor Services
- Canyon & Mesa
- Sensitive Resources
- Four Corners Exploration

- Paved Road
- Dirt Road
- Trail
- Unit Boundary
- Private Ownership
- BLM (Canyons of the Ancients National Monument)

**PREFERRED ALTERNATIVE
Cutthroat Castle Unit
Hovenweep National Monument**

Colorado – Utah
U.S. Department of the Interior / National Park Service
DSC / May 2009 / 320 / 20010



Management Zones

- Park Operations & Visitor Services
- Four Corners Exploration
- Canyon & Mesa
- Sensitive Resources

- Paved Road
- Dirt Road
- Trail
- Unit Boundary
- Private Ownership
- BLM (Canyons of the Ancients National Monument)

**PREFERRED ALTERNATIVE
Goodman Point Unit
Hovenweep National Monument**

Colorado – Utah
U.S. Department of the Interior / National Park Service
DSC / May 2009 / 320 / 20008

ACTIONS COMMON TO BOTH ALTERNATIVES

Under alternatives A and B, The National Park Service would

- Form partnerships with the Bureau of Land Management in Colorado and Utah, the Navajo Nation (surrounding Cajon unit), and appropriate state and local agencies to coordinate on a number of management and operational issues, including resource protection, ruins stabilization, archeological research and surveys, interpretation and education, law enforcement, access road/trail repair and maintenance, trash pickup, and related land-use planning efforts.
- Work with the Bureau of Land Management and the State of Utah to develop protection strategies for the BLM

lands surrounding units of Hovenweep National Monument.

- Cooperate with federal, state, and local agencies and private organizations, as appropriate, on the Vanishing Treasures initiative and other cultural resource protection programs.
- Cooperate with Anasazi Heritage Center for the continued protection and management of the monument's museum collection.
- Work with private landowners, the Navajo Nation, and the State of Utah to protect valuable cultural and natural resources.

USER CAPACITY

INTRODUCTION

User capacity, once referred to as visitor carrying capacity, is the type and level of visitor use that can be accommodated while sustaining the quality of park resources and visitor opportunities consistent with the purposes of a park. Although many people think of capacity as a number of people in a given area, the concept is more complex. Research has shown that user capacity often cannot be measured simply as a number of people, because impacts on desired resource conditions and visitor experiences are often related to a variety of factors. These can include the number of people, the activities in which people engage, where they go, what type of resources are in the area, and the level of management presence.

General management plans are required by law to address the topic of user capacity. The National Park Service defines user capacity as the types and extent of visitor use that can be accommodated while sustaining the quality of resources and visitor opportunities consistent with the purposes of the park. It is a process involving planning, monitoring, and management actions to ensure that a park unit's values are protected.

Managing user capacity in national parks is inherently complex and depends not only on the number of visitors, but also on where they go, what they do, and the "footprints" they leave behind. In managing for user capacity, the park staff relies on a variety of management tools and strategies, rather than solely on regulating the number of people in a park or simply establishing limits on visitor use. In addition, the ever-changing nature of visitor use in parks requires a deliberate and adaptive approach to user capacity management.

Adaptive management is intended to maintain the desired conditions described in the

management zones. Indicators and standards are the tools for monitoring shifts towards or away from desired conditions. An indicator is a measurable variable that can be used to track changes in resource and social conditions related to human activity so that existing conditions can be compared to desired conditions. A standard is the minimum acceptable condition for an indicator. The indicators and standards help translate the broader qualitative descriptions of desired conditions in the management zones into measurable conditions. As a result, park managers can track changes in resource conditions and visitor experiences, and provide a basis for the park staff to determine whether desired conditions are being met. The monitoring component of this process also helps test the effectiveness of management actions and provides a basis for informed adaptive management of visitor use.

User capacity decision making is a continuous process; decisions are adjusted based on monitoring the indicators and standards. Management actions are taken to minimize impacts when needed. The indicators and standards included in this management plan would generally not change in the future. However, as monitoring of the park's conditions continues, managers may decide to modify, add, or eliminate indicators if better ways are found to measure important changes in resource and social conditions. Also, if new use-related resource or visitor experience concerns arise in the future, additional indicators and standards will be identified as needed to address these concerns. The results of the park's monitoring efforts, related visitor use management actions, and any changes to the park's indicators and standards would be available to the public.

INDICATORS AND STANDARDS

Indicators are measurable effects on the condition of resources or values that might change as a result of human use. *Standards* are the maximum acceptable levels of adverse effect on the indicators.

The following indicators and standards have been developed for Hovenweep National Monument. Monitoring resource and visitor experience would occur, and if new knowledge is gained or visitor use patterns change drastically from projected patterns, these indicators would be modified. Table 7 summarizes the identified indicators, standards, and some actions that could be taken when the conditions being monitored are found to be approaching or exceeding the standard.

Visitor Center Crowding

Because most visitors enter the visitor center during their visit, the center can become crowded during busy visitation periods. Monument staff has determined that the practical capacity of the visitor center is 20 visitors at one time. If this number is exceeded, the quality of visitor experience diminishes and desired conditions are not realized. This number could be higher if video viewers replace the current audiovisual system. The standard would be that the capacity is not exceeded more than twice a day during the busy summer season and once per day during the rest of the year. This would not include school groups.

Archeological Sites

Archeological sites would be monitored to determine if any human-caused impacts are occurring. Using either the conditions existing at the time this management plan is approved or the most recent archeological inventory as a baseline, monitoring will measure such indicators as condition of standing ruins, number of artifacts in a lithic scatter, and evidence of vandalism (including but not limited to pothunting).

Springs and Seeps

Water quality and water quantity would be monitored to determine if desired conditions are being met. If conditions are not met, the cause would be identified and remedied, if possible. The monument would work with affiliated tribes to ensure that traditional uses did not adversely impact water quality.

Resource Impacts from Trail Use

Using the conditions existing at the time this management plan is approved as a baseline, trails would be monitored to determine if visitor use impacts are occurring. Indicators would be average trail width, depth (rutting), and erosion caused by the trail. Unauthorized trails are those created by visitors. Possible mitigative measures might include trail "hardening," where the trail is surfaced or otherwise improved to handle more use with fewer impacts on adjacent resources.

Vehicle Parking

Space for vehicle parking is limited at all units of the monument. Although this has not been a problem in the past, if parking areas fill up, visitors could begin parking outside established areas. This would affect resources adjacent to parking areas. Adjacent areas would be monitored to determine if unauthorized parking is adversely affecting resources.

Visitor Crowding on Trails

This is a measure of social capacity expressed as the number of encounters with other parties of visitors. An encounter can be the sight or sound of other parties in addition to direct encounters along trails, so this is really a measure of the total number of people in the unit at one time. According to recent surveys, many visitors feel that their experience at Hovenweep is substantially enhanced by the lack of crowds. Noise often increases with the size of the party. For example, one group of 20 schoolchildren can have more of an impact on solitude and natural quiet than 100 visitors in small groups (2–6 persons). According to the management prescriptions, a high level of

encounters is acceptable in the zone containing the visitor center and major trails at Square Tower unit. The monument staff indicates that crowding on Square Tower trails is not a problem at this time and is not anticipated to become a concern, so no standard would be set in this plan. Monitoring of conditions would continue and a standard could be set if a future increase in visitation warrants such action.

At the outlying units, the expectations are quite different. Visitors to these undeveloped sites do not expect to see or hear a large number of people. The management zoning also prescribes a lower number of encounters to maintain the feelings of remoteness and solitude. To maintain the desired opportunities for quality visitor experiences,

the planning team has determined that there should be no more than three parties at one time in each one of the units.

Goodman Point unit is to be treated a little differently because of the research activities that might be occurring there at any time. Visitors could find a research team conducting archeological or other investigations while they are at the unit. This could affect their experience adversely because of the presence of other people, or it might have a beneficial impact because they can observe an ongoing excavation. The standard for this unit would be no more than three parties at one time in the unit, not including any researchers working at the site.

Table 7: Indicators and Standards

Resource	Indicator	Standard	Possible Mitigation
Visitor Center Crowding	The number of times that the number of visitors (not counting school groups) exceeds established capacity of 20 people for more than 5 minutes at a time	The stated capacity is not exceeded more often than twice per day during the summer season and once per day during the rest of year	Use of a quota system (one visitor out, one visitor in) Move some exhibits and ranger-led programs outside
Archeological Sites	Disturbance (e.g., loss of artifacts, trampling) of lithic scatters and other nonstructural sites Human-caused impacts on standing ruins Vandalism	Lithic and other artifact scatters remain intact Standing ruins receive no impacts No evidence of vandalism	Route trails around open-ground sites Reroute trails to avoid impacts Educate visitors Increase patrols by federal/ state/ county officers
Springs and Seeps	Water quality Water quantity	Water quality does not deteriorate from baseline Water quantity does not decrease due to human activity	Find source of degradation and remedy Identify cause and remedy if feasible
Trail Impacts	Average width of tread Average depth of tread below surrounding terrain Erosion or other impacts on adjacent soil caused by human presence or use of trail Soil crusts Number of unauthorized trails	Not to exceed 110% of baseline Not to exceed average depth of 4" No new impacts No new impacts None	Harden trails (e.g., install trailside "curbs") Increased maintenance Harden trail Rebuild trail to NPS standards to prevent erosion Eliminate or minimize establishment of social trails Develop and present visitor education programs on sensitivity of soil crusts Obliterate unauthorized trails
Parking Areas	Size of primitive parking area (unpaved)	Parking areas do not increase more than 10% above baseline measurement	Increase constructed parking areas Install barriers Harden areas
Crowding on Trails	Number of visitor parties at one time (encounters)	Outlying Units – 3 parties at one time Goodman Point – 3 parties at one time, not including researchers	Issue permits to visit outlying units

MITIGATIVE MEASURES FOR THE ALTERNATIVES

CULTURAL RESOURCES

Congress charged the National Park Service with managing the lands under its stewardship “in such manner and by such means as will leave them unimpaired for the enjoyment of future generations” (NPS Organic Act, 16 USC 1). As a result, the National Park Service routinely evaluates and implements mitigative measures whenever conditions occur that could adversely affect the sustainability of national park system resources.

To ensure that implementation of an alternative protects unimpaired natural and cultural resources and the quality of the visitor experience, a consistent set of mitigative measures would be applied to actions proposed in this plan. The National Park Service would prepare appropriate environmental review (i.e., those required by the National Environmental Policy Act, National Historic Preservation Act, and other relevant legislation) for these future actions. As part of the environmental review, the National Park Service would avoid, minimize, and mitigate adverse impacts when practicable. The implementation of a compliance-monitoring program would enable the national monument to stay within the parameters of National Environmental Policy Act and National Historic Preservation Act compliance documents, and U.S. Army Corps of Engineers Section 404 permits. The compliance-monitoring program would oversee these mitigative measures and would include reporting protocols.

The following mitigative measures and best management practices would be applied to avoid or minimize potential impacts resulting from implementation of the alternatives. These measures would apply to both alternatives.

The National Park Service would preserve and protect, to the greatest extent possible, the cultural resources of Hovenweep National Monument. Specific mitigative measures include the following:

- Continue to develop inventories for and oversee research about archeological, historical, and ethnographic resources to better understand and manage the resources. Continue to manage cultural resources and collections following federal regulations and NPS guidelines. Inventory the monument’s collection and keep it in a manner that would meet NPS curatorial standards.
- Avoid adverse impacts through the use of the *Secretary of the Interior’s Standards for Archeology and Historic Preservation*. If adverse impacts could not be avoided, mitigate these impacts through a consultation process with all interested parties.
- Conduct archeological site monitoring and routine protection. Conduct data recovery excavations at archeological sites threatened with destruction, where protection or site avoidance during design and construction is infeasible.
- Avoid or mitigate impacts on ethnographic resources. Mitigation could include identification of alternative resource gathering areas, and assistance in accessing these areas, continuing to provide access to traditional use and spiritual areas, and screening new development from traditional use areas. Continue and formalize ongoing consultations with culturally associated American Indian people. Protect sensitive traditional use areas to the extent feasible.
- Conduct additional background research, resource inventory, and national register evaluation where information about the location and significance of cultural resources is lacking. Incorporate the

results of these efforts into site-specific planning and compliance documents.

- Wherever possible, locate projects and facilities in previously disturbed or existing developed areas. Design facilities to avoid known or suspected archeological resources. Whenever possible, modify project design features to avoid effects to cultural resources. Limit new developments and locate them on sites that blend with cultural landscapes and not adjacent to ethnographic resources. Situate development to protect significant views within the monument boundaries. If necessary, use vegetative screening, as appropriate, to minimize impacts on cultural landscapes and ethnographic resources.
- Encourage visitors through the monument's interpretive programs to respect and leave undisturbed tribal offerings and archeological resources.
- Strictly adhere to NPS standards and guidelines on the display and care of artifacts. This would include artifacts used in exhibits in the visitor center.

NATURAL RESOURCES

Air Quality

- Implement a dust abatement program. Standard dust abatement measures during construction activities could include the following: apply water or otherwise stabilize soils, cover haul trucks, employ speed limits on unpaved roads, minimize vegetation clearing, and revegetate after construction.

Nonnative Plant Species

- Implement a nonnative species and noxious weed monitoring and abatement program. Standard measures could include the following: ensure construction-related equipment arrives on-site free of mud or seed-bearing material, certify all seeds and straw

material as weed-free, identify areas of noxious weeds before construction, treat noxious weeds or noxious weed topsoil before construction (e.g., topsoil segregation, storage, herbicide treatment), and revegetate with appropriate native species.

Nonnative Animal Species

- Implement programs (including eradication) to manage nonnative animal species where necessary. Priority will be given to managing those species that have or potentially could have a significant impact on monument resources and that can reasonably be expected to be successfully controlled.

Soils

- Build new facilities on soils suitable for development. Minimize soil erosion by limiting the time that soil is left exposed and by applying other erosion control measures, such as erosion matting, silt fencing, and sedimentation basins in construction areas to reduce erosion, surface scouring, and discharge to water bodies. Once work is complete, plant construction areas with native plants in a timely manner.

Vegetation

- Monitor areas used by visitors (e.g., trails) for signs of native vegetation disturbance. Use public education, revegetation of disturbed areas with native plants, erosion control measures, and barriers to control potential impacts on plants from trail erosion or social trailing.
- Develop revegetation plans for the disturbed area and require the use of native species. Revegetation plans should specify seed/plant source, seed/plant mixes, and soil preparation. Salvage vegetation should be used to the extent possible.

Wildlife

- Employ techniques that can reduce impacts on wildlife, including visitor education programs, restrictions on visitor activities, and monument ranger patrols.
- Implement a natural resource protection program. Standard measures would include construction scheduling, biological monitoring, erosion and sediment control, the use of fencing or other means to protect sensitive resources adjacent to construction, the removal of all food-related items or rubbish, topsoil salvage, and revegetation. The protection program could include specific construction monitoring by resource specialists as well as treatment and reporting procedures.

VISITOR SAFETY AND EXPERIENCES

- Implement measures to reduce adverse effects of construction on visitor safety and experience.
- Conduct an accessibility study to understand barriers to programs, facilities, and activities. Based on this study, implement a strategy to provide the maximum level of accessibility.

NOISE ABATEMENT

Mitigation measures would be applied to protect the natural sounds in the national monument. Specific mitigative measures include the following:

- Implement standard noise abatement measures during operations. Standard noise abatement measures could include the following elements: a schedule that minimizes impacts on adjacent noise-sensitive uses, use of the best available noise control techniques wherever feasible, use of hydraulically or electrically powered impact tools when feasible, and

location of stationary noise sources as far from sensitive uses as possible.

- Situate and design facilities to minimize objectionable noise.

VIEWSHEDS / SOUNDSCAPES / NIGHT SKIES

Mitigation measures are designed to minimize visual intrusions. These include the following:

- Design, site, and construct facilities to avoid or minimize adverse effects on natural and cultural resources and visual intrusion into the natural and/or cultural landscape.
- Design all exterior lighting to minimize light pollution.
- Provide vegetative screening, where appropriate.

SUSTAINABLE DESIGN AND AESTHETICS

The monument strives to incorporate the principles of sustainable design and development into all facilities and park operations. Sustainability can be described as the result achieved by doing things in ways that do not compromise the environment or its capacity to provide for present and future generations. Sustainable practices minimize the short- and long-term environmental impacts of developments and other activities through resource conservation, recycling, waste minimization, and the use of energy-efficient and ecologically responsible materials and techniques.

The National Park Service's *Guiding Principles of Sustainable Design* (1993) provides a basis for achieving sustainability in facility planning and design, emphasizes the importance of biodiversity, and encourages responsible decisions. The guidebook describes principles to be used in the design and management of visitor facilities that emphasize environmental

sensitivity in construction, use of nontoxic materials, resource conservation, recycling, and integration of visitors with natural and cultural settings. Hovenweep National Monument would reduce energy costs, eliminate waste, and conserve energy resources by using energy-efficient and cost-effective technology wherever possible.

Energy efficiency would be incorporated into any decision-making process during the

design or acquisition of facilities, as well as into all decisions affecting park operations. The use of value analysis and value engineering, including life cycle cost analysis, would be performed to examine energy, environmental, and economic implications of a proposed development. The monument would encourage suppliers, permittees, and contractors to follow sustainable practices and address sustainable park and nonpark practices in interpretive programs.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The environmentally preferable alternative is defined as “the alternative that will promote the national environmental policy as expressed in section 101 of the National Environmental Policy Act.” Section 101 states:

It is the continuing responsibility of the Federal Government to . . .

- (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- (2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
- (4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choices;
- (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life’s amenities; and
- (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

The environmentally preferable alternative is alternative B, the alternative preferred by the National Park Service for Hovenweep National Monument. This alternative would satisfy the national environmental policy goals. It would provide a high level of protection of natural and cultural resources while concurrently providing for a wide range of neutral and beneficial uses of the environment; it would maintain an environment that supports a diversity and variety of individual choices; and it would integrate resource protection with an appropriate range of visitor uses.

The preferred alternative surpasses the no-action alternative in realizing the full range of goals identified in section 101 of the National Environmental Policy Act. The no-action alternative would not protect resources as well as the preferred alternative. More resource impacts would result from expected increasing use levels in the no-action alternative; thus, goals 1, 4, and 5 would not be met. Adverse impacts on visitor experience also would be likely to increase under the no-action alternative; thus, goals, 3, 4, and 5 would not be met. Therefore, the no-action alternative would not meet the national environmental policy goals as well as the preferred alternative.

ALTERNATIVES AND ACTIONS CONSIDERED BUT DISMISSED FROM FURTHER CONSIDERATION

During the planning process for Hovenweep National Monument, the following additional alternative concepts for management were proposed:

1. Primary Focus on Research and Education. Under this proposal, the National Park Service and the management of Hovenweep National Monument would have focused on providing visitors opportunities to participate in archeological field research, guided by trained professionals. Research opportunities would not have been limited to archeological research. There also would have been opportunities to conduct research on the monument's significant and sensitive natural resources.

This concept was eliminated from further analysis, because, under this concept, a majority of park budget and staff time would be dedicated to managing research and education programs. This posed a potential conflict with the ability to meet the national monument's purpose, significance, and legislative mandate.

2. Focus on providing visitors direct access to the primary ruins. Under this proposal, the National Park Service and the management of Hovenweep National Monument would have focused on natural and cultural resource management while providing visitors with opportunities for intimate self-guiding discovery of the monument's primary ruins.

This concept was eliminated from further analysis because of the potential for unacceptable adverse impacts resulting from increased visitor access to sensitive primary resources. This could create a conflict with the national monument's purpose, significance, and legislative mandate.

Following a briefing on the general management plan, the regional director and deputy regional director of the NPS Intermountain Region determined that due to the limited scope of the actions proposed in the plan, the limited potential for significant impacts, and the lack of political controversy, two alternatives—a no-action alternative and a preferred alternative—were sufficient to analyze the future management of Hovenweep.

FUTURE STUDIES NEEDED

After completion and approval of a general management plan for the national historic site, other more detailed studies and plans would be needed before specific actions could be implemented. As required, additional environmental compliance (National Environmental Policy Act, National Historic Preservation Act, and other relevant laws and policies), and public involvement would be conducted. Those additional studies include, but would not be limited to, the following:

- Administrative history
- Archeological surveys for all remaining units
- Historic structure reports for the stabilization, preservation, or restoration of any prehistoric structures
- A cultural landscape report for all six units of the national monument
- A resource stewardship plan/strategy for the national monument

SUMMARY AND COMPARISON TABLES

Table 8: Summary and Comparison of Alternatives

	Alternative A – No Action	Alternative B – Preferred
Concept	Maintain existing management strategy	Focus on preserving Hovenweep’s remote and primitive character
Archeological Resources	Existing protection programs would continue	Conduct archeological and cultural resource surveys for Holly, Horseshoe/Hackberry, Cajon, and Cutthroat units
Prehistoric Structures	Continue existing management program	Expand priority stabilization and maintenance program for all prehistoric standing structures based on priority list for at-risk structures
Cultural Landscapes	Minimal focus on cultural landscape protection	Conservation archeological research efforts would enhance understanding of ancestral Pueblo community and social development
Ethnographic Resources	Continue monitoring and protection of ethnographic resources	Management zoning and increased research provides enhanced protection of ethnographic resources
Hydrology	Continue existing management program	Implement studies to ascertain a thorough understanding of hydrological resources
Riparian Systems	Minimal focus on riparian systems	Riparian systems would be identified, protected, and maintained throughout the monument
Viewsheds, Soundscapes, Night Sky	Minimal focus on these resources	Develop comprehensive strategy to protect and preserve these resources in partnership with federal, state, and local agencies, monument neighbors, and local communities and organizations
Visitor Experience	Continued opportunities to understand and appreciate the achievements of the ancestral Pueblo peoples	Visitors would have opportunities to experience Hovenweep’s remoteness, solitude, and sense of seclusion that evokes the area’s discovery in the 19th century
NPS Operations	No new facilities	Develop a maintenance facility Develop limited parking and trails at selected locations; obtain appropriate levels of seasonal staffing in law enforcement, maintenance, resources management, and interpretation operations

Table 9: Summary and Comparison of Key Environmental Consequences from Alternatives

Impact Topic	Alternative A – No Action	Alternative B – Preferred
Prehistoric Structures	Permanent negligible to minor adverse impacts Cumulative: Small component of minor to moderate cumulative adverse impacts	Long-term negligible to minor adverse impacts Cumulative: Very small component of minor to moderate adverse impacts Section 106 summary: No adverse impact
Archeological Resources	Permanent negligible to minor adverse impact Cumulative: A very small component of minor to moderate adverse cumulative impacts	Long-term negligible adverse impacts Cumulative: A very small component of minor to moderate permanent adverse cumulative impacts Section 106 summary: No adverse impact
Cultural Landscapes	Long-term or permanent negligible to minor adverse impacts Cumulative: A very small component of minor to moderate adverse cumulative impacts	Long-term negligible to minor adverse impacts Cumulative: A very small component of minor to moderate adverse cumulative impacts Section 106 summary: No adverse impact
Ethnographic Resources	Long-term or permanent minor adverse impacts Cumulative: A very small component of long-term minor to moderate cumulative adverse impacts	Long-term or permanent negligible to minor adverse impacts Cumulative: A very small component of long-term minor to moderate cumulative adverse impacts
Soils	No new impacts on soils Cumulative: No cumulative impacts	Long-term minor adverse impacts Cumulative: Long-term minor to moderate adverse cumulative impacts
Vegetation	No new impacts on vegetation Cumulative: No cumulative impacts	Long-term minor adverse impacts on native vegetation Cumulative: Long-term minor adverse cumulative impacts
Wildlife	No new impacts on wildlife Cumulative: No cumulative impacts	Short-term minor adverse impact;. Long-term negligible adverse impact Cumulative: Long-term minor adverse cumulative impacts
Special Status Species	No effect on special status species Cumulative: No cumulative impacts	Not likely to adversely affect special status species Cumulative: A very slight contribution to minor adverse cumulative impacts
Viewsheds	No impacts on viewsheds Cumulative: No cumulative Impacts	Long-term minor adverse and moderate beneficial impacts Cumulative: Long-term minor to moderate adverse impacts

Impact Topic	Alternative A – No Action	Alternative B – Preferred
Soundscapes	No impacts on soundscapes Cumulative: No cumulative impacts	Short-term minor to moderate adverse impacts; Long-term negligible adverse impacts Cumulative: Long-term minor adverse impacts
Night Sky	Long-term minor adverse impact on night skies Cumulative: would contribute a small adverse component to the overall potential cumulative long-term minor to moderate adverse impact on night skies	Long-term negligible to minor adverse impact and a minor beneficial impact on night skies. Cumulative: would comprise a small component to the overall long-term minor to moderate adverse cumulative impacts
Visitor Use and Understanding	No new effect on visitor use and understanding Cumulative: No cumulative impacts	Long-term minor beneficial impacts Cumulative: Long-term negligible beneficial impacts
Socioeconomic Environment	No effect on socioeconomic conditions Cumulative: No cumulative impact	Short and long-term minor beneficial impacts on socioeconomic conditions Cumulative: Long-term minor beneficial cumulative impacts

AFFECTED ENVIRONMENT

3



INTRODUCTION

This chapter describes the existing environment at Hovenweep National Monument. It provides background information for analyzing the potential environmental effects that would be

anticipated to occur from implementation of the alternatives. It is focused only on park resources, uses, facilities, and socioeconomic characteristics that have the potential to be affected by one or both of the alternatives.

GENERAL DESCRIPTION

Hovenweep National Monument was established by presidential proclamation on March 2, 1923, to protect the ruins of ancestral Pueblo villages spread over a 20-mile expanse of mesa tops and canyons on both sides of the Utah-Colorado border. The multistory towers perched on canyon rims and balanced on boulders lead visitors to marvel at the skill and motivation of their builders. Hovenweep is noted for its solitude and undeveloped, natural character.

The name *Hovenweep* is a Paiute/Ute word that means "deserted valley" and was adopted by pioneer photographer William Henry Jackson in 1874. The Hopi people refer to the monument as Waakiki, which means "place of the refugees."

The monument comprises 785 acres in six separate units: Square Tower, Cajon, Holly, Horseshoe/Hackberry, Cutthroat Castle, and Goodman Point. Land surrounding Hovenweep belongs to the federal government (managed by the Bureau of Land Management), the Navajo Nation, the State of Utah, and private landowners.

MONUMENT UNITS

Square Tower Unit

The monument's visitor contact facility, campground, and primary interpretive facilities are located at the Square Tower unit. Self-guiding loop trails allow visitors to view all of the visible ruins at Square Tower that have standing walls. Wayside exhibits, identification signs, park brochures, and trail guides provide interpretive and educational messages. Ranger-guided interpretive tours are available on a seasonal basis. The National Park Service encourages visitors to begin their visit here, especially if they are first-time visitors or are limited in time or type of vehicle (e.g., low-clearance sedan).

Cajon Unit

Access to Cajon Ruin is by a marked dirt road. A parking area is adjacent to the boundary fence, which has a pass-through to allow visitors to enter the monument unit. Immediately within the fence are an identification sign and a trail register. The National Park Service sign, trail register, and fence have a history of occasional vandalism. Navajo Tribal Lands surround this unit.

Holly Unit

Access to the Holly unit is by dirt road or by a 4-mile-long hiking trail from the campground at Square Tower unit. Holly is one of the more accessible of the outlying monument units, and it is the most visited ruin group after Square Tower. A small parking area and trail register are within the National Park Service boundary. On the trail register is a map of the ruins, a sign-in sheet for visitors, and a short information sheet to introduce the visitors to the ruin. The National Park Service boundary is completely fenced at Holly, with the west boundary being the Colorado – Utah state line.

Horseshoe/Hackberry Unit

Visitors can reach the Hackberry and Horseshoe ruins by a short trail connecting Hackberry and Horseshoe ruins with the dirt access road leading to Holly ruin. A pass-through provides access through the western boundary fence of the Horseshoe/Hackberry unit, and the trail is marked by a sign and trail register. The entire National Park Service boundary is fenced.

Cutthroat Castle Unit

The unit has a fenced boundary and includes a trail register that contains a map of the ruin and a short interpretive message at the small parking area near the ruin. A short trail leads from the parking area to the ruin itself. Cutthroat is the least accessible of the monument's units and receives very little

visitation. Visitors can also reach Cutthroat Castle by parking at an area off the access road on the mesa top to the north and hiking the 0.8-mile-long trail across BLM land. The trail enters the unit on the eastern boundary through the fence. Privately owned land is adjacent to the south side of this unit and Canyons of the Ancients National Monument (managed by the Bureau of Land Management) borders the other three sides.

Goodman Point Unit

Goodman Point is the closest unit to Cortez (12 miles). Increased residential development is occurring along the access road. The National Park Service has fenced the unit, but there is no other site development. The only parking is along the county road, between the road and the boundary fence. A sign within the unit, but out-of-sight of the road, identifies the unit, and there is a trail register at the site. The ruins of an extensive pueblo have mostly collapsed, so there is little to see for the untrained eye. Visitation to this unit is not actively encouraged. Occasionally, some visitors will enter the pass-through to visit the site.

CLIMATE

Hovenweep lies in a high desert region that experiences wide temperature fluctuations, sometimes more than 40 degrees in a single

day. The temperate seasons are spring (April through May) and fall (mid-September through October), when daytime highs average 60°F to 80°F and lows average 30°F to 50°F. Summer temperatures sometime exceed 100°F, making strenuous exercise difficult. The late summer “monsoon” season brings violent storms that often cause flash floods in the normally dry arroyos. Winters are cold, with highs averaging 30°F to 50°F, and lows averaging 0°F to 20°F. Though large snowfalls are uncommon (except in nearby mountains), even small amounts of snow, ice, or moisture can make local trails and roads impassable. Annual precipitation is in the range of 10 to 15 inches.

TOPOGRAPHY

Hovenweep is located on the eastern side of the Colorado Plateau. Elevation of the monument varies from less than 5,200 feet above sea level at the Cajon unit to 6,700 feet above sea level at the Goodman Point unit. Surface topography around Hovenweep is composed of relatively flat plateaus cut by occasional steep-walled canyons. Exposed sandstone bedrock—known as slickrock—is common, especially near the canyon rims. Ancient cultures built structures on the slickrock at the canyon rims or on large boulders.

CULTURAL RESOURCES

The architectural units of the Hovenweep vicinity were first visited and described in print by the Huntington expedition, commissioned by Brigham Young in 1854. Members of the United States Geological and Geographic Survey next described the area in the 1870s.

The ruins described during the early expeditions consisted of well-preserved prehistoric masonry architecture composed of towers, multi-storied living and storage rooms, and subterranean kivas. These sites were situated at the heads of many canyons that drain from Cajon Mesa southward toward the San Juan River. No archeological reports on the area appeared until after the turn of the century (Prudden 1903, 1914, 1918; Morley 1908; Kidder 1910; Morley and Kidder 1917; Cummings 1915; Fewkes 1918, 1919, 1923, 1925). Prior to the 20th century, in the 1890s, tourists and cowboys explored the ruins, primarily led by the Wetherills from Mancos, Colorado.

Hovenweep National Monument was declared by presidential decree in 1923 after a recommendation by Jesse Walter Fewkes. The areas were designated a national monument in order to preserve and protect the ruins for the benefit of future generations of Americans. The National Park Service (Department of the Interior) was charged with the maintenance of the monument and its cultural resources. Because of this, the National Park Service has conducted or overseen the majority of the studies as well as the preservation of the resources.

The monument's current list of classified structures (LCS) ⁵includes 52 structures (see appendix B).

⁵ The LCS is an evaluated inventory of all historic and prehistoric structures that have historical, architectural, and/or engineering significance within parks of the national park system, in which the National Park Service has, or plans to acquire, any legally enforceable interest. The list is evaluated,

CULTURAL CONTEXT

While the vast majority of archeological sites and resources at Hovenweep date from the ancestral Pueblo period, which spans approximately 500 years from AD 800 to AD 1300, the general area surrounding Hovenweep National Monument has been occupied for at least the last 10,000 years (Brew 1946; Hunt and Tanner 1960; Irwin-Williams 1973; Jennings 1978; Judge 1982; Nickens and Hull 1982; Lipe 1993). Archeologists have divided up the period of Hovenweep-area occupation into sequential and analytical time segments.

The PaleoIndian Stage (10,000 BC to 6000/5500 BC)

The long prehistoric period is generally divided into pre-Puebloan and ancestral Puebloan. The pre-Puebloan cultures arrived in the southwestern United States approximately 12,000 BP. These groups are generally thought of as the "big game hunters" and foragers. Their subsistence activities included hunting large game species that are now extinct. The material culture that distinguishes these groups from later arrivals includes the distinctive projectile points that were manufactured. These points are often found in association with the remains of the extinct species. The presence of these projectile points is often the best way to identify the presence of these large game hunters. These early groups left occasional evidence of their passage in the Hovenweep area. Four Gypsum Cave type points were recovered in the vicinity of Hovenweep (Eddy, Kane, and Nickens 1984) and additional materials from

or "classified," by the National Register of Historic Places criteria. Structures are constructed works that serve some form of human activity and are generally immovable. They include buildings and monuments, dams, millraces and canals, nautical vessels, bridges, tunnels and roads, railroad locomotives, rolling stock and track, stockades and fences, defensive works, temple mounds and kivas, ruins of all structural types that still have integrity as structures, and outdoor sculpture.

about 6000 BC were recovered by Greubel (1991) and Fritz (2006).

The Archaic Stage (6000/5500 BC to AD 1)

The Archaic period is defined by an increasing reliance on plant foods and the development of early agricultural practices. This was likely brought about by the gradual extinction of ancient faunal species, which in turn encouraged the exploitation of a greater variety of environmental zones and increased the importance of plant foods. The Oshara tradition, as defined by Irwin-Williams (1973) is the predominant model for the development of cultures during this period, which lasts from around 5000 BC until about 1000 BC. This tradition was first defined in northern New Mexico. In the Four Corners area, and as exemplified by this survey, there are numerous examples of Archaic sites, but often site classification relies on the presence of diagnostic projectile points and many sites do not contain points. These sites are often classified as aceramic, as they lack pottery.

The subsistence strategy for the people of the Archaic period likely included migration to maximize resource use, seasonal gathering of plant seeds, and hunting of large and small game. The composition of the groups probably changed based on resource availability and seasonality. The favored campsites were most likely located near collections of resources that could be exploited. Sedentism likely developed due to the requirement that crops be cared for throughout the season to ensure the best possible harvest. This may have led to the concept of group resource ownership along with residential stability.

The Formative Stage (AD 1–1300)

The beginnings of this stage are marked by a heavier reliance on plant foods. Sedentary lifestyles are defined by the construction of shelters and the utilization of constructed storage facilities to store surplus from the harvests. Maize agriculture is the main focus during this stage, it is also during this time that various drainage units begin to develop their

individual cultural characteristics. Southwestern research has, for many decades, divided the Formative stage into smaller “periods.”

The Basketmaker II Period (AD 1–450)

The period between AD 1 and AD 450 was characterized by an arid climate, which may not have been conducive to dry land farming. However, three sites from this period were located on the Hovenweep Resource Protection Zone survey (Greubel 1991). These sites consisted of storage cists in an alcove, a semi-subterranean structure that incorporates upright slabs, and a group of shallow depressions. The assignment of BMII to these sites is somewhat speculative since it was based on the lack of ceramics and the nature of the lithic assemblage.

The Basketmaker III Period (AD 450/500–750)

The eastern part of the McElmo drainage shows well-developed evidence for this period in contrast to the preceding Basketmaker II period. Well-dated pithouse villages indicate that people were moving into the drainage between AD 500 and AD 600 (Eddy, Kane, and Nickens 1984). These types of villages show widespread use of ceramics. The best evidence for these types of sites is in the eastern part of the drainage, but Winter identified some in the Hovenweep area (Winter 1976: 283–284). The largest archeological unit present on Cajon Mesa (for this period) consists of small single households using one or two pit structures with intervening surface spaces. Villages that are more complex are present to the east and consist of 3 to 4 pithouses along with ramadas, stockades, and possible communal structures.

It is postulated that sites from the late Basketmaker III period were situated for defensive purposes as competition for resources may have intensified, particularly in locations such as Little Ruin Canyon (Winter 1976). Greubel (1991) located six sites in the Hovenweep vicinity from this period; these sites were in somewhat elevated settings

topographically, but were not identified as obvious defensive locations.

The Pueblo I Period (AD 750–900)

The evidence for a Pueblo I occupation at Hovenweep is somewhat controversial. Most scholars contend that the population in the area peaked by AD 750 and was followed by a decline (Eddy, Kane, and Nickens 1984; Greubel 1991), but Winter (1976) contends that there was a three-fold population increase that spread into the pinyon-juniper woodlands and broad canyon bottoms during this period. The few Pueblo I sites that remained in the McElmo or Montezuma Creek drainages are sizeable and represent population consolidation but no large aggregations are present in the Hovenweep area. Winter (1976) identified Pueblo I ceramics on later Pueblo II/Pueblo III sites and suggests that the later sites were built atop older settlements for which surface indicators have been obliterated.

The Pueblo II Period (AD 900–1150)

Greubel (1991) and Winter (1976) believe that only a three-fold population increase can explain the higher number of sites that appear during the Pueblo II period. Winter infers that local population pressures may have forced some families into what would be considered marginal environments. In these harsher environs, irrigation and floodwater farming would be necessary for the production of crops. Ceramics that date later than AD 1000 in association with check and rim dams and reservoir features indicate that the trend continued.

In the eastern part of the McElmo drainage, the Pueblo II sites are larger and more complex, and these sites incorporate more public architecture than earlier occupations. It is postulated that this trend is influenced by the expansion of the Chacoan network, however there are other possible cultural donors in the area. Power centers such as Yellowjacket Pueblo or Sand Canyon Pueblo are situated at confluences between the deeper canyons of the McElmo drainage.

Eddy, Kane, and Nickens (1984) have proposed the “Yellowjacket Phase” that dates between AD 1050 and AD 1225/1250.

The Pueblo III Period (AD 1150–1300)

The Pueblo III period is exemplified by population aggregation and a more intensive use of agriculture. The first part of this period saw population increases through AD 1150 (Eddy, Kane, and Nickens 1984; Greubel 1991). In some areas on Cajon Mesa and in the Hovenweep vicinity in general, populations actually began to decline. The true canyon-head complexes, for which Hovenweep is famous, begin to flourish at about AD 1225, and this was identified as the major harbinger of the Hovenweep Phase as defined by Eddy, Kane, and Nickens (1984). Throughout the Pueblo III period, the abandonment of large communal mesa-top villages occurred. However, more of the local populations may have continued farming the mesa tops. Floodwater and irrigation farming also continued at Hovenweep. It is also theorized that with increasing aridity of the region, foraging for wild plant foods may have had a resurgence but was less successful than during the Basketmaker and Archaic periods.

Hovenweep’s vertically oriented communities are limited to Cajon Mesa within the McElmo drainage; the meaning of this architecture is poorly understood. Many believe that these communities with restricted access and unusual boulder top and canyon rim settings are inherently defensive, mainly associated with a need to control access to a commodity of water. Others assert that the complex series of loopholes in the masonry walls have an astronomical link; however, many of these loopholes do not have an apparent association with astronomical events.

The public architecture is limited to the towers (and possibly the water control/irrigation features) in these canyonhead communities. This is divergent from the norm for large communities of the Pueblo III period, which usually contain plazas or courtyards. The buildings appear to be planned

structures to which planned blocks of rooms were added later. There are also comparatively few kivas in these sites when considering the kiva-to-room ratio identified at large sites such as Yellowjacket, Goodman Point, or Sand Canyon Pueblos.

Towers are usually present at the large communities of this period, but not in as many numbers as seen at Hovenweep. As seen from this perspective, the towers of Hovenweep can be considered unique.

The Late Prehistoric (Protohistoric) Period (AD 1300–1850)

The canyonhead complexes that define Hovenweep were abandoned by AD 1300, as were the other settlements in the area now known as the Great Sage Plain. The reasons for this abandonment vary, and may include societal pressures, environmental stress, or prolonged drought.

More than 500 years passed after the abandonment of Hovenweep before the arrival of historic European Americans. This timeframe is poorly documented. Ancestors of the three American Indian groups (Navajos, Utes, and Paiutes) in the area are thought to have arrived during this era (Tipps and Hewitt 1989). The Utes and Paiutes, who are both Numic speakers, were in southeast Utah during this time. They were also present in the Canyonlands area northwest of Hovenweep, possibly as early as 1380 (Geib et al. 1986). Navajos, who are Athabaskan speakers, most likely entered the southwest no later than the late 1500s, according to Bailey and Bailey (1978). The Navajos are thought to have moved into southeast Utah sometime during the 18th century (Nickens 1982). Much research is needed before there is a clear understanding of the late prehistoric or protohistoric period.

PREVIOUS ARCHEOLOGICAL INVESTIGATIONS

Archeological projects conducted within the monument date back to the 1940s, with Riley, Schroeder in the 1960s, and San Jose State University in the mid-1970s. Most of these projects focused on the standing architecture; however the San Jose State project concentrated on locating agricultural fields associated with the large habitations surrounding the canyon heads.

In 1948, Carrol L. Riley conducted an archeological survey at five of the six units at Hovenweep National Monument (Riley 1948). This survey concentrated only on standing masonry architecture and bears no resemblance to a modern pedestrian survey, either in field methodology or recording techniques.

In 1962, Al Shroeder conducted an archeological survey between the detached Hovenweep units of Square Tower and the Holly-Hackberry group. He recorded 31 sites in this area, mainly concentrating on masonry and other obvious prehistoric cultural manifestations. These sites consisted of 19 dwelling or ceremonial buildings, 9 farm structures, 2 farm terrace sites, and 1 ledge granary (Shroeder 1963).

During the early to middle 1970s, Winter, from San Jose State University in California, conducted a multi-year archeological survey and testing project in and around the Hovenweep units. Unfortunately, documentation was scant during this project and many of the artifact scatters that were recorded were not relocated 30 years later. Much of this project focused on locating farm field and agricultural features (Winter 1975, 1976, 1977; Woosley 1978).

In 1990, Alpine Archaeological Consultants, Inc. of Montrose, Colorado, conducted a Class III cultural resources inventory of 4,090 acres surrounding or adjacent to four units of Hovenweep National Monument in south-

western Colorado and southeastern Utah. This survey was known as the Hovenweep Resource Protection Zone (RPZ) Survey, and was conceived by the Bureau of Land Management and the National Park Service. The survey evolved out of a growing concern for the abundant archeological resources in the Hovenweep vicinity and the constantly increasing threats to these resources by energy development and vandalism. The survey areas were adjacent to the Square Tower, Holly, Horseshoe / Hackberry and Cutthroat units. The RPZ survey resulted in the recordation of 372 archeological sites and 710 isolated finds. Most of the sites were Pueblo II/III ancestral Puebloan; there were also Archaic, historic American Indian, and earlier Ancestral Puebloan sites. In addition, a substantial number of prehistoric sites of unknown cultural affiliation were recorded (Greubel 1991).

In 1994, test excavations around the base of Square Tower revealed the presence of a buried kiva and several rooms. This work was done in conjunction with conservation efforts to preserve the eroding boulder upon which Square Tower was built. The excavations and preceding conservation work was conducted by personnel from Mesa Verde National Park (Nordby and Johnson 2005; Fiero 2002).

In 1996, personnel from Mesa Verde National Park (who administered Hovenweep at the time) attempted to relocate all of the sites identified by Winters, placed a site stake at each site relocated, and recorded a GPS point. In 1998, personnel from Mesa Verde National Park conducted a systematic archeological survey of the area that was to contain the newly constructed visitor center (Mayberry and Nordby 1998). Two lithic scatters were identified and recorded. These sites were relocated during the 2004 survey.

In 2003, Crow Canyon Archaeological Center conducted a 100% survey of the Goodman Point Unit (Hovezak et al. 2004). A total of 42 sites were recorded, which comes out to 189 sites per square mile. Goodman Point Unit,

therefore, has one of the highest site densities in the Mesa Verde region. The 42 sites have 52 distinct temporal components, which include occupation during the following periods: Basketmaker III (AD 600–750), 3 components; Pueblo II (AD 900–1150), 15 components; Pueblo III (AD 1150–1300), 24 components; and Historic (post AD 1900), 3 components). The Pueblo III occupation is the most extensive, obscuring the evidence of earlier use.

In 2004, staff from Hovenweep National Monument conducted a 100% survey of the upland area of the Square Tower Unit. A total of 42 archeological sites were identified and recorded during that survey. Some of the sites had been previously identified and/or recorded; however, all sites, whether previously recorded or not, were documented. This survey did not include the recordation of the well-known standing architecture along and below the canyon rims.

CULTURAL LANDSCAPES

Cultural landscapes include elements of the built environment—for example, kivas, towers, check dams, irrigation ditches, food growing areas, and roads—in a larger context that conveys the story of human habitation in the area. The ways in which these people located their settlements in relationship to the natural environment and to other settlements can inform modern visitors about the conditions the people of these cultures faced and the ways they functioned in their environment.

Cultural landscapes incorporate natural systems and features and reflect spatial organization, land use, cultural traditions, building forms and the use of materials, circulation patterns, views and vistas, and archeological sites.

The cultural landscapes at Hovenweep exhibit the characteristics of ethnographic landscapes, which are defined as landscapes

containing a variety of natural and cultural resources that associated people define as heritage resources and that have significance to their way of life.

ETHNOGRAPHIC RESOURCES

Tribal representatives have identified all pre-Columbian archeological sites as ethnographic resources that are important in tribal histories and cultural identities. In addition to the archeological resources, other resources such as seeps and springs are associated with subsistence, religious, ceremonial, or other traditional activities.

PREHISTORIC STRUCTURES⁶

Square Tower Unit

The largest unit of Hovenweep, Square Tower is located at the head of Little Ruin Canyon on Cajon Mesa. This complex contains towers, great houses, unit-type houses, and structures built in alcoves and atop boulders, all grouped around a perennial spring.

Among the major structures at Square Tower unit are Square Tower, Hovenweep Castle, Hovenweep House, Stronghold House, Eroded Boulder House, Tower Point, Twin Towers, and Rim Rock House.

In addition to the investigations listed previously, the Historic American Building Survey/Historic American Engineering Record documented the Square Tower unit in 1993–1994. The archeological survey of the upland portion of Square Tower was completed in the spring of 2008. This survey identified and recorded 42 archeological sites, ranging from lithic scatters that date from the Archaic stage (8,000 BP to AD 1) to the remains of an ethnohistoric Navajo sweat lodge.

⁶ For the national monument's list of classified structures (LCS), please see appendix B.

Cajon Unit

This unit includes the remnants of a small hamlet of pueblos that was inhabited for a period of approximately 200 years, from about AD 1100 to AD 1300, around the end of the Pueblo occupation of Cajon Mesa. Most of the buildings at Cajon were built in the early to middle 1200s. They are located at the southern end of Cajon Mesa at the head of Allen Canyon. The site includes remnants of standing walls, rubble mounds, terraces, check dams, and a permanent spring at the head of the canyon. Archeologists speculate that this spring has been used since the Paleo-Indian stage, 12,000 years ago, and probably contributed to the success of ancestral Pueblo agriculture at Cajon.

Holly Unit

The Holly group is located at the head of Keeley Canyon. The sites within the Holly group are located both in the canyon and along the rim and include the Holly House, a two-story “great house” typical of the Hovenweep architectural style; a two-story tower; several multiroom room blocks; rock shelters; a rim dam; retaining walls; possible kiva depressions; and middens.

Horseshoe/Hackberry Unit

The Horseshoe/Hackberry unit is within the central portion of Cajon Mesa. The Hackberry group is a large complex at the head of Hackberry Canyon. The group consists of a tower, rooms, talus slope debris, a rim dam, possible kiva depressions, an alcove, and cultural deposits.

The Horseshoe group, also known as the Upper Hackberry group, includes Horseshoe House; a circular kiva; a small room against the west wall of the kiva; a two-story oval tower; and a number of standing wall remnants, lithic scatters, and walls in cliff overhangs.

Cutthroat Castle Unit

This unit is located at the head of a tributary of Hovenweep Canyon. This site is composed

of a number of towers, kivas, room blocks, constructed granaries, natural shelter granaries, and an extensive water control system. Cutthroat Castle, with its accompanying kiva rooms, is the major architectural feature of the site. This unit's higher elevation creates an environment capable of supporting a variety of plant species. Located at 6,300 feet in elevation, the Cutthroat Castle unit is the only unit on Cajon Mesa that is in the pinyon belt. Pinyon pines are more common here than juniper.

Goodman Point Unit

This unit is the first prehistoric archeological area set aside by the federal government in the United States. This 162-acre unit consists of a large, collapsed ancestral Pueblo village that was inhabited during the Pueblo II and Pueblo III time periods, approximately spanning the

years AD 900 to AD 1300. The village site consists of approximately 1,000 rooms, with numerous kivas and towers. One great kiva is at the southern edge of the site. There is evidence of a roadway remnant in the northern portion of the unit. There is also evidence of check dams, ditches, and other remnants of irrigation systems.

Unlike the other units of Hovenweep, which are at canyonheads, Goodman Point is situated in a mesa top between two canyons, Goodman Canyon and Sand Canyon. Its proximity to the large village site in Sand Canyon, part of Canyons of the Ancients National Monument, has raised intriguing questions about the relationship between the two villages. The ruins of an extensive pueblo have not been excavated, so there is little to see for the untrained eye.

NATURAL RESOURCES

SOILS

Soils at Hovenweep are composed of fine-grained sand, sandy loam, clay loam, gravelly loam, or stony loam. The soils are from erosion of the sandstone bedrock and were deposited by the wind or water in recent times. These soils supported crops of corn, beans, and squash and sustained large numbers of people throughout the Four Corners region for hundreds of years.

Bedrock is exposed in many parts of the monument where there is no soil, usually near canyon rims or in wash bottoms.

The Natural Resources Conservation Service identifies eight soil units within the boundaries of Hovenweep (see table 10).

From a construction consideration, soils with high to moderate frost action would not be suitable for building roads or paved trails. Soils with a high risk of corrosion to concrete and steel would not be suitable for building structures.

BIOLOGICAL SOIL CRUSTS

Areas of the Colorado Plateau in arid and semiarid climates typically include biological soil crusts that form on top of the soil. These crusts, also known as cryptogamic, cryptobiotic, or microbiotic crusts, are formed by living organisms and their by-products that create a crust of soil particles bound together by organic materials. Biological soil crusts on the Colorado Plateau are predominantly composed of cyanobacteria, lichens, and mosses (NRCS 1997).

Soil crusts contribute to a number of functions in the environment occurring at the land surface or soil-air interface. These

include soil stability and erosion, atmospheric nitrogen fixation, nutrient contributions to plants, soil-plant-water relations, infiltration, seedling germination, and plant growth.

Damage to the crusts from livestock grazing or human activities (e.g., hiking, biking, off-highway vehicle use) causes decreases in organism diversity, soil nutrients, and organic matter. Native vegetation can be adversely affected when crusts are disrupted or destroyed. Although full recovery of disrupted biological soil crusts is a slow process, visual recovery can be completed in as little as one to five years, depending on climatic conditions (NRCS 1997).

VEGETATION

Four of Hovenweep's six units are on Cajon Mesa in the juniper/sage and sagebrush areas in the central portion of the mesa. In addition to juniper trees and sagebrush, there are rabbitbrush, cliffrose, Mormon tea, yucca, serviceberry, and various cacti. Additional tree species such as cottonwood, willow, and hackberry are found in the moister canyon bottoms.

Big sagebrush is a hardy, cold-tolerant shrub that dominates most of the monument units. Big sagebrush tends to be widely spaced with herbaceous plants and grasses living beneath. The intershrub spaces are barren or contain biological soil crusts composed of lichens and algae (see "Biological Soil Crusts," above). Hovenweep has a healthy stand of sagebrush with high native species diversity. Cheatgrass is present but not dominant in shrubland or grassland systems. The pre-settlement mosaic of cool-season bunch grasses and deep-rooted shrubs may now be one of the rarest ecosystems in the Southwest (Grahame 2002), but is present in most units of Hovenweep.

Table 10: Soils

Name	Description	Construction Considerations
Rizno-Gapmesa Complex	3-9% slopes, depth 60 to 40 inches	Low frost action, moderate to low risk of corrosion to uncoated steel and concrete
Rizno-Ruinpoint-Rock Outcrop Complex	1-15% slopes, depth 4 to 20 inches	Low potential for frost action, high risk of corrosion to steel and moderate risk to concrete
Romberg-Crosscan-Rock Outcrop Complex	25+% slopes, depth 6 to 20 inches	Moderate frost action, high risk of corrosion to steel and low to concrete
Typic Torriorthents-Rock Outcrop Complex	12-15% slopes, depth 6 to 80 inches	Low frost action, high risk of corrosion to steel and moderate to concrete
Wetherill Loam	3-6% slopes, depth up to 60 inches, prime farmland if irrigated	Moderate frost action, high risk of corrosion to steel and low to concrete
Cohona-Pulpit Complex	3-9% slopes, depth 20 to 40 inches	Moderate frost action, high risk of corrosion to steel and low to concrete
Claysprings very stony clay loam	12-65% slopes, depth 6 to 20 inches	Low potential for frost action, high risk of corrosion to steel and concrete
Gladel-Pulpit Complex	3-9% slopes, depth 12 to 40 inches	Low frost action, moderate risk of corrosion to steel and low to concrete

Source: Soil Survey Geographic Database, Natural Resources Conservation Service

South of the Square Tower unit, the sagebrush gradually changes into a mixed shrubland vegetation zone composed of shadscale, greasewood, snakeweed, and grasses. In overgrazed and disturbed areas outside the monument, snakeweed has become the dominant plant. This mixed shrubland vegetation zone covers the southern end of Cajon Mesa and the San Juan River valley. Cajon is the only unit of Hovenweep in this vegetation zone.

The Goodman Point unit lies at a higher elevation in a pinyon/juniper forest. Because this unit has been under government ownership and protection since 1889, the vegetation is in a relatively pristine state. Colorado pinyon pine (*Pinus edulis*) is the most common pine species in this woodland type, and Utah juniper (*Juniperus osteosperma*) is the most common juniper.

Tree species in pinyon/juniper woodlands have developed both drought and cold resistance. Pinyons dominate at higher elevations and tend to form more closed-canopied stands; these woodlands commonly include a significant shrub component of oaks and alderleaf, mountain mahogany, and limited grasses. Juniper tends to grow at lower elevations and in more arid areas, because its scaled foliage allows it to conserve water more effectively than pinyon pine. Juniper-dominated woodlands tend to include open savannas of scattered trees without a significant shrub component, except in areas where big sagebrush has become dominant as a consequence of overgrazing (Grahame 2002).

In some units, there are invasive, nonnative plants, such as cheatgrass, nonnative thistle, and tamarisk. One of these areas is near the

head of Hackberry Canyon. Nonnative species are becoming an increasing concern throughout the Park Service. The management of nonnative plants is guided by NPS policies and an implementation plan.

WILDLIFE

The wildlife species seen at Hovenweep are typical of a Colorado Plateau ecosystem. Most of the mammals in the area are wide-ranging species. Common species include desert cottontail, black-tailed jackrabbit, deer mouse, badger, ringtail, skunk, porcupine, coyote, kit fox, bobcat, mountain lion, and mule deer. Other species with specialized habitats such as rock ledges or crevices include bats, rock squirrels, mice, and wood rats (packrats). Bats, mice, wood rats, insects, and arachnids will also occasionally inhabit the ruins.

Various neotropical songbirds, raptors, and owls reside in and around the area. The monument's bird list indicates that 83 species have been sighted (NPS Southeast Utah Group Resource Management, 2004). Monument staff has seen a salamander (*Ambystoma tigrinum*) in the seep pool at Cajon. Reptiles include collared, sage brush, and western fence lizards and various snakes. Pinyon gnats are typically plentiful enough in mid-May through late June to be an annoyance to visitors and monument staff.

SPECIAL STATUS SPECIES

Wildlife

The following species, which have been seen at Hovenweep, are not federally listed but remain “of special concern” to the National Park Service:

Peregrine falcon (*Falco peregrinus*) –
(Species of Special Concern)

The peregrine falcon has one of the most extensive natural distributions of any bird in the world and is found on all continents

except Antarctica. The American peregrine falcon breeds in Mexico, the United States, and Canada. Peregrines lay their eggs in “scrapes” in the soft earth on the floor of ledges and small shallow caves located high on cliff walls (USFWS Endangered Species Web page). They prefer open territory for foraging and use pinyon/juniper woodlands. No nesting sites for the peregrine falcon have been found at Hovenweep.

Northern goshawk (*Accipiter gentilis*) –
(Utah state species of special concern)

These large hawks nest in trees of a wide variety of forest and woodland types, including the coniferous woodlands of the Colorado Plateau. They forage in both heavily forested and relatively open habitats. Population numbers of this species had been declining in the United States, but now seem to be increasing. No nesting sites for the Northern goshawk have been found at Hovenweep, and the monument is too low in elevation to provide their typical habitat in southeastern Utah.

Plants

Some plant species of special concern might inhabit Hovenweep, but additional plant inventories are needed to confirm this. An extensive inventory of vascular plants in Hovenweep was conducted in 2003. This resulted in the addition of 156 new taxa, but did not result in the finding of any sensitive species.

VIEWSHEDS

Maintaining the natural views is essential to preserving the character of both the central Mesa Verde and surrounding regions. Unobstructed natural views are important because they contribute to feelings of remoteness, solitude, and a sense of timelessness—fundamental qualities of the Hovenweep experience. As expressed through a recent visitor survey and comments received

during scoping for this document, visitors to the monument desire and seek out these qualities.

Natural views are important at all of the monument's units, but the planning team identified two critical vistas. Because the monument's units are so small, most of the viewsheds are outside the park boundary.

The first critical viewshed is from the back of the visitor center at Square Tower unit, looking due south to due east. This landscape is expansive and includes Little Ruin Canyon in the foreground extending out to Sleeping Ute Mountain, 20 miles away. Currently, there are very few modern impacts on this natural setting, with the exception of a power transmission line.

The second critical viewshed is from the trailhead at the Goodman Point unit. From here one can see more than 180 degrees—from the west through south and to the east.

A regional pattern of development that has evolved over the past decade indicates that there will probably be future land pressures on the monument from both the eastern and western boundaries. The expanding population of the Navajo Nation is reflected in the related growth of homesteads on reservation lands bordering the Utah units of the park. Residential expansion from Cortez is affecting the traditional farmlands and pinyon/juniper uplands surrounding the Colorado units.

NIGHT SKIES

Related to viewsheds is the night sky. The clarity of night skies is important to visitor experience as well as to the ecological systems of the area. The lack of human-caused light not only makes the area excellent for star gazing, but also influences many species of animals, such as birds that navigate by the stars or prey animals that reduce their activities during moonlit nights. Furthermore,

the dark night sky of the monument allows visitors an opportunity to ponder the influences of the stars, planets, and earth's moon on the Ancestral Puebloan way of life.

The rural setting of the monument currently provides for relatively dark nights. No quantitative studies have been done at the monument, but it is assumed that the most remote units (Cajon, Holly, Hackberry, and Cutthroat) would have the clearest and darkest night skies. Goodman Point Unit is the nearest to Cortez, Colorado, and may have its nighttime skies affected by city lights. The Square Tower Unit is the only unit that contains any light-producing development (e.g., administrative buildings, park housing, campground).

Artificial light sources both within and outside the park have the potential to diminish the clarity of night skies. Even minor elements of artificial lighting within park boundaries could affect the pristine quality of local night skies. It is NPS policy that artificial light sources be the minimum necessary for safety and security and be designed so that all light is directed downward and does not shine into the sky.

SOUNDSCAPES

NPS Management Policies 2006 (§4.9) requires the National Park Service to preserve the natural soundscapes of the park. Natural soundscapes exist in the absence of human-caused sound and are part of the biological or physical resources of the monument. Examples of such natural sounds in Hovenweep include

- sounds produced by birds and insects to define territories or attract mates
- sounds produced by physical processes such as wind in the trees or claps of thunder

From 2000 to 2007, acoustic measurements were made at 23 locations in Southeast Utah Group (SEUG) parks. The objectives of the

study were to determine natural ambient (Lnat) and existing ambient (L50) sound levels in the primary land cover types in SEUG units and to determine the primary sources of sounds (natural and non-natural) in those locations (Ambrose and Florian 2008, draft).

The most common land cover types in SEUG units are Colorado Plateau Mixed Bedrock Canyon and Tableland; Colorado Plateau Pinyon-Juniper Shrubland; Colorado Plateau Pinyon-Juniper Woodland; Colorado Plateau Blackbrush – Mormon-tea Shrubland; and Inter-Mountain Basins Big Sagebrush Shrubland (NatureServe classification system). These land cover types compose over 75% of SEUG units. Several of the land cover types had similar acoustic characteristics and were grouped into two acoustic zones: Pinyon-Juniper/Canyons and Shrubland/Grassland. A third land cover type, Riparian areas, although less common, had different acoustic characteristics. Therefore, three acoustic zones were established.

Table 11: Sound Levels (dBA) for the Three Primary Groups of Land Cover Types

Land Cover Group	L50 Median	Lnat Median
Pinyon-Juniper/Canyons	23.6/19.3	21.4/18.4
Shrubland/Grassland	23.1/19.1	21.6/18.3
Riparian	27.9/19.7	25.1/18.6

Natural ambient sound levels in Pinyon-Juniper/Canyons and Shrubland/Grassland land cover types were similar to each other both in summer and in winter (although both were higher in summer). Summer sound levels in riparian areas were higher by about 4 dBA. Winter sound levels in all land cover types (excluding developed areas) were also similar (although very near or below the noise floor of the instruments).

Wind, birds, and insects were the most common natural sounds. Animal sounds (mostly insects and birds) were much more common in summer. Aircraft and vehicles were the most common non-natural (human-caused) sounds, audible about 25% of the time (Ambrose and Florian 2008, draft).

At Hovenweep, natural sounds predominate throughout the remote units and, therefore, throughout the majority of the monument. Other than aircraft noise, human-caused sounds are usually confined to developed areas, such as at Square Tower, and to areas near major roads. Visitor use produces intermittent noises, such as vehicle engines, doors closing, and voices. The level of noise varies by location and time of year, relative to the number of visitors. These sound levels also fluctuate with variations in weather conditions, including temperature, wind, humidity, and the general topography of the area. Ambient noise levels are impacted by sources outside the monument boundaries, such as machinery associated with gas well production and ranching operations.

VISITOR USE AND UNDERSTANDING

Although there are other national park units in the region that contain ruins of American Indian communities (e.g., Mesa Verde National Park, Aztec Ruins National Monument), visitors to Hovenweep seem to be interested in opportunities for a more personal and uncrowded experience with the community remains and the surrounding landscape. This is provided by the monument's perceived remoteness, sensitive visitor control measures, and distinctive cultural resources.

Visitors to Hovenweep can enjoy short hikes, natural quiet, camping, and some of the finest examples of ancestral Pueblo architecture in the Southwest. The trail system provides access to the primary ruins at each of the units. All units are currently open to the public, but outlying units are in remote locations and can be difficult to reach. Visitors are encouraged to begin their exploration of Hovenweep at the visitor center in the Square Tower unit.

Most visitors begin their visit at the visitor center. Here, they can receive orientation and information on the monument, talk with an NPS representative, buy interpretive material from the cooperating association, and view exhibits about the resources. The self-guiding Square Tower Group trail begins at the visitor center; visitors can walk 300 yards to the canyon overlook, take a 1.25-mile, round-trip walk to Square Tower, or hike a 2.0-mile loop around the entire community of structures.

Visitors wishing to see the outlying units can request site bulletins and driving directions at the visitor center. Each of the other units has a small unimproved parking area, an opening in the boundary fence, and primitive trails leading to the primary ruins.

For visitors wanting a longer hike, a 4-mile trail (8-mile round trip) connecting the Square Tower unit with the Holly unit is available.

A 31-site campground with flush toilets is located in the Square Tower unit. Sites are available on a first come, first served basis. There are no showers, hot water, or dump stations available. The campground is intended for tent or car camping, and vehicles longer than 36 feet are not encouraged to use the campground. The nearest lodging is in Cortez, Colorado; Blanding, Utah; and Bluff, Utah.

Access to the monument is via paved roads from Cortez, Colorado; Pleasant View, Colorado; Blanding, Utah; and Bluff, Utah. Road signs direct visitors to the Square Tower unit but not to outlying units. Hovenweep is open year-round. The visitor center is open daily, with extended hours in the summer; it is closed on winter holidays. An entrance fee is collected at the Square Tower unit only. Hiking trails are open during daylight hours.

VISITOR USE

Visitor use at Hovenweep is a combination of day use and overnight camping. The average length of visit is one to three hours. The majority of use occurs at the Square Tower unit. According to a recent survey, only 36% of all visitors visited an outlying unit (Delost and Lee 2000). This could be attributed to the remote nature and unimproved access of the other units or to lack of advertisement. Visitors are encouraged to begin their visit at the visitor center in the Square Tower unit. After touring the visitor center and Square Tower ruins, most visitors seem to feel their visit is complete and do not wish to see the other units.

The peak visitor season is May through October. The park can receive from 75 to 200 visitors a day during this season. The slowest visitation period is November through February. Less than 10% of monument

visitors stay in the campground (NPS Public Use Statistics Office).

Data on monument visitation is obtained from visitor registers at the various units, campground receipts, and staff observations. Like most NPS sites, visitation has been in a slow decline over the last four to five years (see table 12).

Table 12: Annual Monument Visitation, 1993–2007

Year	Visits
2007	26,903
2006	26,446
2005	26,602
2004	27,927
2003	29,953
2002	33,121
2001	37,099
2000	45,837
1999	43,913
1998	23,439
1997	25,160
1996	28,316
1995	28,253
1994	23,733
1993	25,769

Data from NPS Public Use Statistics Office

Monument staff have noticed that visitation temporarily increases when wildfires or other events cause the closure of all or part of Mesa Verde National Park. It is important to note that visitation for the entire national park system has been exhibiting a slight downward trend in the last few years (NPS Public Use Statistics Office).

VISITOR UNDERSTANDING

Visitors’ understanding of the monument’s history and resources is gained through the interpretation and education program.

Interpretive media, an information desk staffed by NPS representatives, and a cooperating association sales area at the visitor center deliver the basic interpretive themes. The new visitor center and interpretive exhibits are in good condition and provide current information.

Visitors most commonly participate in self-guiding tours on the Square Tower Group interpretive trail. Most outlying units are interpreted through a site bulletin during the visitor season. Park rangers present interpretive talks, walks, and evening programs and make roving contacts at the Square Tower and outlying units. Tours for schools and other organized groups are conducted by the staff, provided advance notice has been given. Environmental study guides for teachers are available on the Hovenweep website.

VISITOR EXPERIENCE OPPORTUNITIES

Hovenweep’s remote nature and unique resources invite visitors to “ponder the past.” The self-initiating and self-guiding format allows visitors to determine how they want to interact with the monument and how much time they want to spend. The Square Tower unit offers the familiar visitor center setting with exhibits and an information desk. The trail here is easy to follow, and other people can be seen at most times.

Those visitors wanting an even less-structured visit can get directions to the outlying units, where the experience is more solitary and personal. Visitors to these units must be more self-sufficient and must realize they might not see monument staff or other visitors.

VISITOR SAFETY AND ACCESS

The main access road is well marked, but visitors to the outlying units must use some navigation and map reading skills to locate the unmarked sites.

Poisonous plants are not a concern in the area, but cactus and other spiny plants could injure persons who walk off the established trails. Venomous snakes also are occasionally encountered. There are numerous abrupt drops along the canyons, and visitors are warned to remain on the trails. Seasonal high temperatures and the arid climate can quickly lead to dehydration. Warning messages and

safety tips regarding these hazards appear in monument brochures and other media.

The visitor center and restrooms are wheelchair accessible. The Square Tower Group trail is paved to the first overlook and can be negotiated by persons in wheelchairs with some assistance. All other trails are uneven and primitive.

SOCIOECONOMIC ENVIRONMENT

SOCIAL VALUES

Visits to units of the national park system are often social outings with family or friends. This is true at Hovenweep, where, according to a visitor study conducted by Northern Arizona University (Delost and Lee 2000), 83% of all visitors came with their families or friends. However, only 8% of the groups came with children under 12 years of age.

ECONOMIC VALUES

The area of consideration for economic analysis is composed of Montezuma County, Colorado, and San Juan County, Utah. Four units of the national monument are in Montezuma County, and two units (including Square Tower unit) are in San Juan County. There are no designated metropolitan areas in either county. Cortez, Colorado, is the largest town in the region.

Montezuma County, Colorado

Cortez and several smaller communities are located in this county. The U.S. Census Bureau indicates that the county's population was 25,217 in 2006. The population increased by 5% in the period 2000–2006. The state of Colorado experienced a population increase of 10.5% over the same period. The average number of persons per square mile in the county was 11.7 in 2000, and the statewide average was 41.5.

The median household income in the county in 2004 was \$34,416, whereas the median for the entire state of Colorado was \$50,105. The per capita income in 1999 was \$17,003, and the figure for the state was \$24,049. The economy of Montezuma County is based in retail sales, tourism (food and accommodations), agriculture, and construction.

San Juan County, Utah

Bluff, Blanding, and several smaller, rural communities lie within this county. The U.S. Census Bureau indicates that the county's population was 14,265 in 2006. The population decreased by 1% in the period 2000–2006. The state of Utah experienced an increase of 14.2% in population over the same period. San Juan is the larger of the two counties by area, but the average number of persons per square mile in 2000 was only 1.8, whereas the statewide average in Utah was 27.2.

The median household income in the county in 2000 was \$28,750 while the median for the state of Utah was \$47,224. The per capita income in 1999 was \$10,229 while the figure for the state was \$18,185. The economy of San Juan County is based in agriculture, retail trades, and tourism (food and accommodations).

Impact of Visitor Spending on Local Economy

Hovenweep National Monument hosted 26,903 recreation visits in 2007 (the most recent year for which economic data is available). Of all the one-day recreation visits, 20% were local residents on day trips and 54% were visitors from outside the local area on day trip. For overnight visits, 20% were visitors staying in lodges, motels, hotels, or bed & breakfasts in the area and 8% were camping. The 26,000 recreation visits represent about 2,000 party days⁷ in the local area. On average, visitors spent \$59 per party per day in the local area. Total visitor spending is estimated to be \$118,000 in 2006 (table 13).

The direct effects of this spending include sales, income, and jobs in businesses selling

⁷ one party days = one day spent in the area by a group of visitors traveling together (a party).

goods and services directly to park visitors. The direct effects of the spending by Hovenweep visitors were \$225,000 in sales, \$100,000 in personal income (wages and salaries), \$116,000 in value added, and five jobs.

As visitor dollars circulate through the local economy, secondary effects create an additional \$74,000 in direct sales, \$25,000 in personal income, \$46,000 in value added, and 1 job (table 14).

The social and economic situation in the two-county area is affected by a combination of many factors, including the amount of tourism. As described previously, attraction of visitors to nearby NPS units has a direct effect on the local economy. If visitation to NPS units and other attractions in the region were to increase above current levels, there would be a resulting economic boost.

Table 13: Visitation and Spending by Visitor Segments (2006 data)

	Local Day Trips	Non-local Day Trips	Hotel	Camp	Total
Segment Shares in Rec. Visits	20%	54%	20%	6%	100%
Party Days	400	1,080	400	120	2,000
Average Spending Per Party Day	\$30	\$46	\$127	\$45	\$87
Total Spending	\$12,000	\$50,100	\$50,900	\$5,400	\$118,000

Source: NPS Public Use Statistics Office

Table 14: Economic Impacts of Visitor Spending by Sector (2006)

Sectors	Sales	Personal Incomes	Jobs	Value Added
Direct Effects	\$225,000	\$100,000	5	\$116,000
Secondary Effects	\$74,000	\$25,000	1	\$46,000
Total Effects	\$299,000	\$125,000	6	\$162,000

Source: NPS Public Use Statistics Office

ENVIRONMENTAL CONSEQUENCES

4



INTRODUCTION

The National Environmental Policy Act (NEPA) requires that environmental documents discuss the environmental impacts of a proposed federal action, feasible alternatives to that action, and any adverse environmental effects that cannot be avoided if a proposed action is implemented. In this case, the proposed federal action would be the adoption of a general management plan for Hovenweep National Monument. The following portion of this document analyzes the environmental impacts of implementing the alternatives on cultural resources, natural resources, the visitor experience, and the socioeconomic environment. The analysis is the basis for comparing the beneficial and adverse effects of implementing the alternatives.

Because of the general, conceptual nature of the actions described in the alternatives, the impacts of these actions are analyzed in general qualitative terms. Thus, this environmental assessment should be

considered a programmatic analysis. If and when site-specific developments or other actions are proposed for implementation subsequent to this general management plan, appropriate detailed environmental and cultural compliance documentation will be prepared in accordance with National Environmental Policy Act and National Historic Preservation Act requirements.

This chapter begins with a description of the methods and assumptions used for each topic. Impact analysis discussions are organized by alternative and then by impact topic under each alternative.

Each alternative discussion also describes cumulative impacts and presents a conclusion. At the end of the chapter, there is a brief discussion of unavoidable adverse impacts, irreversible and irretrievable commitments of resources, and the relationship of short-term uses of the environment and the maintenance and enhancement of long-term productivity.

CUMULATIVE IMPACT ANALYSIS

A cumulative impact is described in the Council on Environmental Quality's regulation 1508.7 as follows:

Cumulative impacts are incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other action. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

To determine potential cumulative impacts, other projects within and surrounding Hovenweep National Monument were identified. Projects were identified by discussions with monument staff, federal land managers, and representatives of county and town governments. Potential projects identified as cumulative actions included any planning or development activity that was currently being implemented or would be implemented in the reasonably foreseeable future. Impacts of past actions were also considered in the analysis.

These actions are evaluated in conjunction with the impacts of each alternative to determine if they have any cumulative effects on a particular natural, cultural, or socioeconomic resource or visitor use. Because most of these cumulative actions are in the early planning stages, the qualitative evaluation of cumulative impacts was based on a general description of the project.

PAST ACTIONS

Setting aside the Goodman Point unit as a government reservation in 1889 preserved the pristine vegetation community and an extensive unexcavated pueblo from incompatible land uses. Establishment of the national monument in 1923 set aside the

Square Tower, Holly, Horseshoe, and Cajon units for long-term protection, thus benefiting natural and cultural resources in these units. Hackberry and Goodman Point units were added to Hovenweep in 1952, and Cutthroat Castle was added in 1956.

Development in the form of roads, trails, structures, a new visitor center, and infrastructure has occurred within the monument. This development has benefited visitors and monument operations but has disrupted some natural resources, such as soils, vegetation, and wildlife habitat. The new visitor center replaces an old contact station that impinged on the primary ruins.

PRESENT ACTIONS

The monument has received funding for a number of projects. These projects include the following:

- ruin wall stabilization
- rehabilitation of housing and other facilities
- disturbed site restoration
- moving the museum collection
- reestablishing historic vegetation monitoring plots
- a study of the hydrology around Square Tower Group
- treating prehistoric architecture
- archeological inventories at Goodman Point and Square Tower units
- archeological testing at Goodman Point

When implemented, these projects could cause short-term adverse impacts on resources during implementation, but in the long term, they will result in benefits to prehistoric sites, natural resources, visitor experience, and monument operations.

Exploration and extraction of fluid (oil and gas) and solid materials is occurring on private, state, and federal lands surrounding the monument units.

The Bureau of Land Management's Canyons of the Ancients National Monument, which is adjacent to the Hovenweep units in Colorado, was established in 2000. The Bureau of Land Management is in the process of completing a monument management plan for the monument. The NPS planning team coordinated with the Bureau of Land Management on issues such as compatible adjacent land uses and joint protection of viewsheds and resources for both plans.

FUTURE ACTIONS

A new maintenance facility is planned for construction in the Square Tower unit. This would benefit operations at the monument but would adversely impact some natural resources on about 2 acres. A small parking area is planned for the Goodman Point unit. This would benefit operations but would adversely impact a small area of the unit (about 2,500 square feet.)

The presence of Canyons of the Ancients National Monument could attract more attention to the area, which, in turn, could lead to increasing visitation at both monuments.

It can be assumed that suburban sprawl will continue around Cortez, Colorado. This continued growth could result in greater use (legal and illegal) and subsequent adverse impacts on the Goodman Point unit, the unit closest to Cortez.

Mineral exploration and extraction is expected to continue at existing or increased levels on lands around the monument.

IMPAIRMENT OF NATIONAL MONUMENT RESOURCES

In addition to determining the environmental consequences of implementing the preferred and other alternatives, NPS *Management Policies 2006* (section 1.4) requires analysis of potential effects to determine whether or not proposed actions would impair resources and values.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on monument resources and values. However, the laws do give the National Park Service the management discretion to allow impacts on resources and values when necessary and appropriate to fulfill the purposes of the monument, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within a park, that discretion is limited by the statutory requirement that the National Park Service must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of a responsible NPS manager, would harm the integrity of monument resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values (NPS *Management Policies 2006* 1.4.5). An impact on any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the monument, or

- key to the natural or cultural integrity of the monument or to opportunities for enjoyment, or
- identified in the monument's general management plan or other relevant NPS planning documents as being of significance.

Impairment may result from visitor activities; NPS administrative activities; or activities undertaken by concessioners, contractors, and others operating in the monument. Impairment may also result from sources or activities outside the monument.

An evaluation of impairment is not required for some impact topics including visitor experience (unless the impact is resource based), transportation, NPS operations, or the socioeconomic environment. When it is determined that an action(s) would have a moderate to major adverse effect, a justification for nonimpairment is made. Impacts of only negligible or minor intensity would, by definition, not result in impairment. The determination of impairment for the preferred alternative is found in appendix D.

UNACCEPTABLE IMPACTS

The impact threshold at which impairment occurs is not always readily apparent. Therefore, the National Park Service applies a standard that offers greater assurance that impairment will not occur by avoiding unacceptable impacts. These are impacts that fall short of impairment, but are still not acceptable within a particular park's environment. Park managers must not allow uses that would cause unacceptable impacts; they must evaluate existing or proposed uses and determine whether the associated impacts on park resources and values are acceptable. Virtually every form of human activity that takes place within a park has some degree of effect on park resources or values, but that does not mean the impact is unacceptable or that a particular use must be disallowed.

Therefore, for the purposes of these policies, unacceptable impacts are impacts that, individually or cumulatively, would

- be inconsistent with a park's purposes or values, or
- impede the attainment of a park's desired future conditions for natural and cultural resources as identified through the park's planning process, or
- create an unsafe or unhealthful environment for visitors or employees, or
- diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values, or
- unreasonably interfere with any of the following:
 - park programs or activities
 - an appropriate use
 - the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park
 - National Park Service concessioner or contractor operations or services

In accordance with NPS *Management Policies 2006*, park managers must not allow uses that would cause unacceptable impacts to park resources. To determine if unacceptable impact could occur to the resources and values of Hovenweep National Monument, the impacts of the alternatives in this general management plan were evaluated based on the previously identified criteria. A determination on unacceptable impacts is made in the conclusion statement for each of the physical resource topics carried forward in this chapter.

IMPACT ANALYSIS METHODOLOGY

The planning team based the impact analysis and the conclusions in this chapter largely on the review of existing literature and studies, information provided by experts in the National Park Service and other agencies, and monument staff insights and professional judgment. The team's method of analyzing impacts is further explained below. It is important to remember that all the impacts have been assessed under the assumption that mitigating measures have been implemented to minimize or avoid impacts. If mitigating measures described in "Chapter 2: Alternatives, Including the Preferred Alternative" were not applied, the potential for resource impacts and the magnitude of those impacts would increase.

Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision Making* presents an approach to identifying the duration (short or long term), type (adverse or beneficial), and intensity or magnitude (e.g., negligible, minor, moderate, or major) of the impact(s); that approach has been used in this document. Direct and indirect effects caused by an action were considered in the analysis. Direct effects are caused by an action and occur at the same time and place as the action. Indirect effects are caused by the action and occur later in time or farther removed from the place, but are still reasonably foreseeable.

The impact analyses of the action alternative describe the *difference between* implementing the no-action alternative and implementing the action alternative. To understand a complete "picture" of the impacts of implementing the action alternative, the reader must also take into consideration the impacts that would occur under the no-action alternative.

Additional information on methodology that is specific to some topics is presented with the discussion of those topics.

DURATION OF IMPACTS

For the purposes of comparative analysis in this document, the following definitions of duration will be used for all resource topics except soundscapes:

Short-term. Impacts lasting less than two years. This length of time was selected because it takes into account disturbance caused during construction plus a reasonable amount of time to allow for revegetation to occur.

Long-term. Impacts that are expected to last two years or more.

SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT AND IMPACTS ON CULTURAL RESOURCES

In this environmental assessment, impacts on cultural resources (archeological resources, prehistoric structures, the cultural landscape, and ethnographic resources) are described in the following terms:

type – are the effects beneficial or adverse?

context – are the effects site-specific, local, or even regional?

duration – are the effects short term, lasting less than two years, or long term, lasting more than two years?

intensity – are the effects negligible, minor, moderate, or major?

This is consistent with the regulations of the Council on Environmental Quality (CEQ) that implement the National Environmental Policy Act (NEPA). Because definitions of intensity (negligible, minor, moderate, or major) vary by impact topic, intensity definitions are provided separately for each impact topic. These impact analyses are intended, however, to comply with the requirements of both

NEPA and §106 of the National Historic Preservation Act (NHPA).

In accordance with the Advisory Council on Historic Preservation's regulations implementing §106 of the NHPA (36 CFR Part 800, *Protection of Historic Properties*), impacts on cultural resources were also identified and evaluated in the following way:

- (1) determining the area of potential effects;
- (2) identifying cultural resources present in the area of potential effects that are either listed in or eligible to be listed in the National Register of Historic Places;
- (3) applying the criteria of adverse effect to affected, national register-eligible or national register-listed cultural resources; and
- (4) considering ways to avoid, minimize, or mitigate adverse effects.

Under the advisory council's regulations, a determination of either *adverse effect* or *no adverse effect* must also be made for affected national register – listed or national register – eligible cultural resources. An *adverse effect* occurs whenever an impact alters—directly or indirectly—any characteristic of a cultural resource that qualifies it for inclusion in the national register; the impact diminishes the integrity (or the extent to which a resource retains its historic appearance) of its location, design, setting, materials, workmanship,

feeling, or association. Adverse effects also include reasonably foreseeable effects caused by the alternatives that would occur later in time, be farther removed in distance, or be cumulative (36 CFR 800.5, *Assessment of Adverse Effects*). A determination of *no adverse effect* means there is an effect, but the effect would not diminish the characteristics of the cultural resource that qualify it for inclusion in the national register.

CEQ regulations and the National Park Service's *Conservation Planning, Environmental Impact Analysis and Decision-Making* (Director's Order 12) also call for a discussion of mitigation, as well as an analysis of how effective the mitigative measures would be in reducing the intensity of a potential impact—for example, reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. It does not suggest that the level of effect as defined by §106 is similarly reduced. Cultural resources are nonrenewable resources, and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse effect under §106 might be mitigated, the effect remains adverse.

CULTURAL RESOURCES IMPACT ANALYSIS

Analysis of potential impacts on cultural resources was based on research, knowledge of monument resources, and the best professional judgment of planners, archeologists, ethnographers, and historians who have experience with similar types of projects.

PREHISTORIC STRUCTURES

Definitions of Intensity Levels

Negligible. Impact is at the lowest levels of detection, with neither adverse nor beneficial consequences. The determination of effect for §106 would be *no adverse effect*.

Minor Adverse Impact. alteration of a feature(s) would not diminish the overall integrity of the resource. The determination of effect for §106 would be *no adverse effect*.

Moderate Adverse Impact. alteration of a feature(s) would diminish the overall integrity of the resource. The determination of effect for §106 would be *adverse effect*. A memorandum of agreement is executed among the National Park Service and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation, in accordance with 36 CFR 800.6(b). Measures identified in the memorandum of agreement to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate.

Major Adverse Impact. alteration of a feature(s) would diminish the overall integrity of the resource. The determination of effect for §106 would be *adverse effect*. Measures to minimize or mitigate adverse impacts cannot be agreed on, and the National Park Service and applicable state or tribal historic preservation officer and/or Advisory Council on Historic Preservation are unable to negotiate and execute a memorandum of

agreement in accordance with 36 CFR 800.6(b).

Impacts from the No-action Alternative

Analysis. To appropriately preserve and protect national register-listed or national register-eligible prehistoric structures, all stabilization and preservation efforts would be undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995). Stabilization and preservation would have no adverse effects on prehistoric structures. Under the no-action alternative, impacts on above-ground prehistoric structures, including towers, walls, check dams, and trails could result from trampling, unauthorized visitor access to cultural sites, vandalism, and theft. Inadvertent adverse impacts include knocking top course stones loose by walking on or leaning against ruin walls and creating social trails that contribute to erosion and the destabilization of original architecture. Intentional vandalism includes inscribing graffiti, dismantling stones in walls, and probing or digging in ruin walls. Such adverse impacts could be mitigated through additional stabilization of site architecture and the elimination of social trails in the vicinity of the ruins. Continued ranger patrols and visitor education program emphasizing the significance and fragility of such resources and how visitors can reduce their impacts on prehistoric structures, would discourage vandalism and the inadvertent impacts, thus minimizing adverse impacts. The actions under this alternative would result in negligible to minor long-term adverse impacts on prehistoric structures.

Cumulative Effects. A variety of past, present, and reasonably foreseeable future actions have affected and could in the future affect prehistoric structures both at Hovenweep National Monument and on adjacent lands. Livestock grazing, energy development on adjacent lands, archeological

investigations, looting, and vandalism have resulted in minor to moderate adverse impacts on prehistoric structures. Reconstruction of some structures also affected these resources. Future energy development on lands adjacent to the Cajon unit could also result in minor to moderate adverse impacts on standing prehistoric resources as a result of vibrations caused by drilling and extraction efforts.

The long-term negligible to minor adverse impacts of this alternative, in conjunction with the adverse impacts of past, present, and reasonably foreseeable future actions, would result in minor to moderate long-term cumulative adverse impacts on prehistoric structures. Any adverse impacts on prehistoric structures resulting from implementation of alternative A would be a very small component of the minor to moderate adverse cumulative impact.

Conclusion. Implementation of the no-action alternative would result in permanent negligible to minor adverse impacts, which would be a small component of the minor to moderate cumulative adverse impact. The implementation of indicators, standards, and monitoring of user capacity, continued ranger patrol, and emphasis on visitor education, would help to minimize impacts resulting from visitor use near prehistoric structures.

This alternative would not result in any unacceptable impacts to prehistoric structures as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

Impacts from the Preferred Alternative

To appropriately preserve and protect national register-listed or national register-eligible prehistoric structures, all stabilization and preservation efforts would be undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995). Stabilization and preservation would have no adverse effects on prehistoric structures. Under the preferred alternative, impacts on aboveground prehistoric structures, walls, check dams, and trails could result from trampling, unauthorized visitor access to cultural sites,

vandalism, and theft. It is reasonable to assume that increased population growth in the Four Corners region could result in additional visitation at Hovenweep National Monument, thereby increasing the potential for adverse impacts. Inadvertent adverse impacts include knocking top course stones loose by walking on or leaning against ruin walls and creating social trails that contribute to erosion and the destabilization of original architecture. Intentional vandalism includes inscribing graffiti, dismantling stones in walls, and probing or digging in ruin walls.

Such adverse impacts could be mitigated through additional stabilization of site architecture and the elimination of social trails in the vicinity of the ruins. The implementation of indicators, standards, and monitoring of user capacity; continued ranger patrol; and emphasis on visitor education regarding the significance and fragility of such resources and how visitors can reduce their impacts on prehistoric structures, would discourage vandalism and the inadvertent impacts, minimizing adverse impacts. The actions under this alternative would result in negligible to minor long-term adverse impacts on prehistoric structures.

Cumulative Effects. A variety of past, present, and reasonably foreseeable future actions have affected and in the future could affect prehistoric structures both at Hovenweep National Monument and on adjacent lands. Livestock grazing, energy development on adjacent lands, archeological investigations, looting, and vandalism have resulted in minor to moderate adverse impacts on prehistoric structures at Hovenweep. Reconstruction of some structures also affected these resources. Future energy development on lands adjacent to the Cajon unit could also result in minor to moderate adverse impacts on standing prehistoric resources as a result of vibrations caused by drilling and extraction efforts.

The long-term negligible to minor adverse impacts of this alternative, in conjunction with the adverse impacts of past, present, and reasonably foreseeable future actions, would

result in minor to moderate long-term adverse impacts on prehistoric structures. Any adverse impacts on prehistoric structures resulting from implementation of alternative B would be a very small component of the minor to moderate adverse cumulative impact.

Conclusion. Implementation of the preferred alternative would result in long-term negligible to minor adverse impacts, which would be a small component of the minor to moderate cumulative adverse impact. Monitoring of user capacity, continued ranger patrol, emphasis on visitor education, and stabilization efforts would help mitigate adverse impacts on prehistoric structures.

This alternative would not result in any unacceptable impacts of prehistoric structures as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

Section 106 Summary. After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR 800.5, Assessment of Adverse Effects), the National Park Service concludes that implementation of alternative B would have no adverse effect on prehistoric structures at Hovenweep National Monument.

ARCHEOLOGICAL RESOURCES

Definitions of Intensity Levels

Negligible. Impact is at the lowest levels of detection, with neither adverse nor beneficial consequences. The determination of effect for §106 would be no adverse effect.

Minor Adverse Impact. Disturbance of a site(s) results in little, if any, loss of integrity. The determination of effect for §106 would be no adverse effect.

Moderate Adverse Impact. Disturbance of a site(s) results in loss of integrity. The determination of effect for §106 would be adverse effect. A memorandum of agreement is executed among the National Park Service and applicable state or tribal historic

preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures identified in the memorandum of agreement to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA impact analysis from major to moderate.

Major Adverse Impact. Disturbance of a site(s) results in loss of integrity. The determination of effect for §106 would be adverse effect. Measures to minimize or mitigate adverse impacts cannot be agreed on and the National Park Service and applicable state or tribal historic preservation officer and/or the Advisory Council on Historic Preservation are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).

Impacts from the No-action Alternative

Archeological sites continually deteriorate, due primarily to the effects of weather and gravity. Left alone, sites will inevitably degrade over time. However, impacts from human visitation and use contribute to the effects of natural agents and can substantially increase the rate of site deterioration. Archeological resources adjacent to or easily accessible from visitor use areas or trails would continue to be vulnerable to inadvertent damage and vandalism. Inadvertent impacts would include picking up or otherwise displacing pottery sherds and other artifacts, the compaction of cultural deposits, and the creation of social trails (which can lead to erosion and destabilization of the original site architecture). Intentional vandalism includes removing artifacts and probing or digging in sites. Inadvertent damage or vandalism would result in a loss of surface archeological materials, alteration of artifact distribution, and a reduction of contextual evidence.

Many such adverse impacts could be mitigated through additional stabilization of the site, the elimination of social trails to disturbed or vulnerable sites, and/or the systematic collection of surface artifacts for long-term curation. Continued ranger patrols and visitor education programs emphasizing

the significance and fragility of such resources and how visitors can reduce their impacts on archeological resources, would discourage vandalism and inadvertent impacts and thus minimize adverse impacts. The actions under this alternative would result in negligible to minor permanent adverse impacts on archeological resources.

The staff of Hovenweep National Monument would continue to work to develop partnerships with the Bureau of Land Management and Navajo Nation to ensure that archeological resources on lands outside the monument would be protected to the greatest extent possible. Continuing NPS involvement in interagency planning and regional planning efforts would benefit archeological resources by ensuring that regional land management decisions take into account effects on archeological resources outside of the monument boundaries.

Cumulative Impacts. A variety of past, present, and reasonably foreseeable future actions have affected and in the future could affect archeological resources both at Hovenweep National Monument and on adjacent lands. Livestock grazing, energy development on adjacent lands, archeological investigations, looting, and vandalism have resulted in minor to moderate adverse impacts on archeological resources at Hovenweep.

Drilling and extraction efforts on lands adjacent to Hovenweep could also result in minor to moderate adverse impacts on undiscovered archeological resources.

The permanent negligible to minor adverse impacts of this alternative, in conjunction with the minor to moderate adverse impacts of past, present, and reasonably foreseeable future actions, would result in minor to moderate permanent cumulative adverse impacts on archeological resources. Any adverse impacts on archeological resources resulting from implementation of alternative A would be a very small component of the minor to moderate adverse cumulative impact.

Conclusion. Implementation of the no-action alternative would result in permanent, negligible to minor adverse impacts on archeological resources, which would be a small component of the minor to moderate cumulative adverse impact. This alternative would not result in any unacceptable impacts outlined in §1.4.7.1 of *NPS Management Policies 2006*.

Impacts from the Preferred Alternative

Archeological sites continually deteriorate, due primarily to the effects of weather and gravity. Left alone, sites will inevitably degrade over time. However, impacts from human visitation and use contribute to the effects of natural agents and can substantially increase the rate of site deterioration. Archeological resources adjacent to or easily accessible from visitor use areas or trails would continue to be vulnerable to inadvertent damage and vandalism. Inadvertent impacts would include picking up or otherwise displacing pottery sherds and other artifacts, the compaction of cultural deposits, and the creation of social trails (which can lead to erosion and destabilization of the original site architecture). Intentional vandalism includes removing artifacts and probing or digging in sites. Inadvertent damage or vandalism would result in a loss of surface archeological materials, alteration of artifact distribution, and a reduction of contextual evidence.

Many such adverse impacts could be mitigated through additional stabilization of the site, the elimination of social trails to disturbed or vulnerable sites, and/or the systematic collection of surface artifacts for long-term curation. The implementation of indicators, standards, and monitoring of user capacity; continued ranger patrol; and emphasis on visitor education, regarding the significance and fragility of such resources and how visitors can reduce their impacts on archeological resources, would discourage vandalism and inadvertent impacts and minimize adverse impacts. The actions under this alternative would result in negligible to minor long-term adverse impacts on archeological resources.

As appropriate, archeological surveys and monitoring would precede any ground disturbance associated with the construction of a new maintenance facility and office space at the Square Tower unit, improvements to parking areas and trails, and the replacement of pit toilets with vault toilets. National register-eligible or national register-listed archeological resources would be avoided to the greatest extent possible, and few, if any, adverse impacts would be anticipated. In the unlikely event that such resources could not be avoided, an appropriate mitigative strategy would be developed in consultation with the appropriate state or tribal historic preservation officer. Impacts on such archeological resources would be adverse, of moderate intensity, and permanent.

The staff of Hovenweep National Monument would continue to work to develop partnerships with the Bureau of Land Management and Navajo Nation to ensure that archeological resources on lands outside the monument would be protected to the greatest extent possible. Continuing NPS involvement in interagency planning and regional planning efforts would benefit archeological resources by ensuring that regional land management decisions take into account effects on archeological resources outside of the monument boundaries.

Cumulative Effects. A variety of past, present, and reasonably foreseeable future actions have affected and in the future could affect archeological resources both at Hovenweep National Monument and on adjacent lands. Livestock grazing, energy development on adjacent lands, archeological investigations, looting, and vandalism have resulted in minor to moderate adverse impacts on archeological resources. Drilling and extraction efforts on adjacent lands could also result in minor to moderate adverse impacts on previously undiscovered archeological resources.

The permanent negligible to minor adverse impacts of this alternative, in conjunction with the minor to moderate adverse impacts of

past, present, and reasonably foreseeable future actions, would result in minor to moderate permanent cumulative adverse impacts on archeological resources. Any adverse impacts on archeological resources resulting from implementation of alternative B would be a very small component of the minor to moderate adverse cumulative impact.

Conclusion. Long-term negligible to minor adverse impacts on archeological resources would result from the actions in alternative B. This alternative would not result in any unacceptable impacts as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

Section 106 Summary. After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, Assessment of Adverse Effects), the National Park Service concludes that implementation of alternative B would have no adverse effect on archeological resources at Hovenweep National Monument.

CULTURAL LANDSCAPES

Definition of Intensity Levels

Negligible. Impact is at the lowest levels of detection, with neither adverse nor beneficial consequences. The determination of effect for §106 would be *no adverse effect*.

Minor Adverse Impact. Alteration of a pattern(s) or feature(s) of the landscape would not diminish the overall integrity of the landscape. The determination of effect for §106 would be *no adverse effect*.

Moderate Adverse Impact. Alteration of a pattern(s) or feature(s) of the landscape would diminish the overall integrity of the landscape. The determination of effect for §106 would be *adverse effect*. A memorandum of agreement is executed among the National Park Service and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures

identified in the memorandum of agreement to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate.

Major Adverse Impact. Alteration of a pattern(s) or feature(s) of the landscape would diminish the overall integrity of the landscape. The determination of effect for §106 would be *adverse effect*. Measures to minimize or mitigate adverse impacts cannot be agreed on, and the National Park Service and applicable state or tribal historic preservation officer and/or Advisory Council on Historic Preservation are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).

Impacts from the No-action Alternative

Under the no-action alternative, existing conditions would remain unchanged. There would be no construction-related impacts on cultural landscapes. Natural systems and features, the scale and visual relationships among landscape features, as well as the monument's topography, vegetation, circulation features, and land use patterns, would be unaltered.

Visitation levels would remain unchanged, but visitation could impact archeological sites and prehistoric structures, important components of the monument's cultural landscapes.

Archeological sites and prehistoric structures adjacent to or easily accessible from visitor use areas or trails would continue to be vulnerable to inadvertent damage and vandalism. Such adverse impacts could be mitigated through additional stabilization of the sites and the elimination of social trails to disturbed or vulnerable sites. Continued ranger patrols and visitor education programs emphasizing the significance and fragility of such resources and how visitors can reduce their impacts on them, would discourage vandalism and inadvertent impacts and thus minimize adverse impacts. Actions under this alternative would result in negligible to minor long-term or permanent adverse impacts on cultural landscapes.

To appropriately preserve and protect components of the cultural landscapes, all stabilization and preservation efforts, as well as daily, cyclical, and seasonal maintenance, would be undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995). Stabilization and preservation would have no adverse effects on cultural landscapes.

Cumulative Effects. A variety of past, present, and reasonably foreseeable future actions have affected and could in the future affect cultural landscapes at Hovenweep National Monument. Grazing, energy development on adjacent lands, archeological investigations, development of NPS facilities, looting, and vandalism have resulted in minor to moderate long-term or permanent adverse impacts on cultural landscapes both at Hovenweep National Monument and on adjacent lands. Similar impacts can be anticipated from ongoing development outside the monument's boundaries.

As described previously, implementation of the no-action alternative could result in negligible to minor long-term or permanent adverse impacts on cultural landscapes. The negligible to minor adverse impacts associated with the no-action alternative, in combination with the minor to moderate long-term or permanent adverse impacts of other past, present, and reasonably foreseeable future actions, would result in minor to moderate adverse cumulative impacts. However, the no-action alternative would be expected to contribute only minimally to the adverse cumulative impacts. Thus, any adverse impacts on cultural landscapes resulting from implementation of the no-action alternative would be a very small component of the minor to moderate adverse cumulative impact.

Conclusion. Implementation of the no-action alternative would result in long-term or permanent negligible to minor adverse impacts, which would be a very small component of the minor to moderate cumulative adverse impact. This alternative would not result in any unacceptable impacts

as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

Impacts from the Preferred Alternative

To appropriately preserve and protect national register-listed or national register-eligible cultural landscapes, all stabilization and preservation efforts, as well as any daily, cyclical, and seasonal maintenance, would be undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995). Stabilization and preservation would have no adverse effects on cultural landscapes.

Careful design would ensure that the construction of the maintenance facility and additional office space at the Square Tower unit would minimally affect the scale and visual relationships among landscape features. Any new construction would be similar in scale, size, and massing to existing buildings and, if appropriate, the new construction could be painted a flat, nonreflective color to enable it to meld into the monument's sandstone bedrock background and be as visibly unobtrusive as possible. Because the maintenance facility and office space would be constructed in or adjacent to the existing park operations area, the topography, patterns of native vegetation, circulation features, and land use patterns of the landscape would remain largely unaltered by such actions, resulting in long-term negligible to minor adverse effects.

The placement of utilities underground would have minimal, if any, effect on the existing topography, spatial organization, or land use patterns of the cultural landscape. Once the underground utility line is installed and the trench is backfilled, the disturbed ground would be restored to its pre-construction contour and condition. Only short-term negligible adverse effects would be anticipated.

Careful design would also ensure that improvements to existing trails and parking areas would minimally affect the scale and visual relationships among landscape features or circulation patterns and features. In

addition, the topography, native vegetation patterns, and land use patterns would remain largely unaltered. Any adverse impacts would be long term or permanent and would range in intensity from negligible to minor.

Visitation could impact archeological sites and prehistoric structures, important components of the monument's cultural landscapes. Archeological sites and prehistoric structures adjacent to or easily accessible from visitor use areas or trails would continue to be vulnerable to inadvertent damage and vandalism. Such adverse impacts could be mitigated through additional stabilization of the sites and the elimination of social trails to disturbed or vulnerable sites. Continued ranger patrols and visitor education programs emphasizing the significance and fragility of such resources and how visitors can reduce their impacts on them, would discourage vandalism and inadvertent impacts and thus minimize adverse impacts. Potential impacts related to visitation under this alternative would result in negligible to minor long-term or permanent adverse impacts on cultural landscapes.

Cumulative Effects. A variety of past, present, and reasonably foreseeable future actions have affected cultural landscapes in the past and could affect cultural landscapes at Hovenweep National Monument in the future. Grazing, energy development on adjacent lands, archeological investigations, development of NPS facilities, looting, and vandalism has all adversely affected the cultural landscape at Hovenweep.

The long-term negligible to minor adverse impacts of the preferred alternative in conjunction with the minor to moderate long-term or permanent adverse impacts of other past, present, and reasonably foreseeable future actions, would result in minor to moderate adverse impacts on cultural landscapes. However, any adverse impacts on cultural landscapes resulting from implementation of the preferred alternative would be a small component of the minor to moderate adverse cumulative impact.

Conclusion. Implementation of the preferred alternative would result in long-term or permanent negligible to minor adverse impacts, which would be a small component of the minor to moderate cumulative adverse impact. This alternative would not result in any unacceptable impacts as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

Section 106 Summary. After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, Assessment of Adverse Effects), the National Park Service concludes that implementation of alternative B would have no adverse effect on cultural landscapes at Hovenweep National Monument.

ETHNOGRAPHIC RESOURCES

Definition of Intensity Levels

Negligible. Impact(s) would be barely perceptible and would alter neither resource conditions, such as traditional access or site preservation, nor the relationship between the resource and the affiliated group's body of practices and beliefs. The determination of effect on traditional cultural properties (ethnographic resources eligible to be listed in the national register) for §106 would be *no adverse effect*.

Minor Adverse Impact. impact(s) would be slight but noticeable, but would appreciably alter neither resource conditions, such as traditional access or site preservation, nor the relationship between the resource and the affiliated group's body of practices and beliefs. The determination of effect on traditional cultural properties (ethnographic resources eligible to be listed in the national register) for §106 would be *no adverse effect*.

Moderate Adverse Impact. Impact(s) would be apparent and would alter resource conditions. Something would interfere with traditional access, site preservation, or the relationship between the resource and the affiliated group's practices and beliefs, even though the group's practices and beliefs would survive. The determination of effect on

traditional cultural properties (ethnographic resources eligible to be listed in the national register) for §106 would be *adverse effect*.

Major Adverse Impact. Impact(s) would alter resource conditions. Something would block or greatly affect traditional access, site preservation, or the relationship between the resource and the affiliated group's body of practices and beliefs, to the extent that the survival of a group's practices and/or beliefs would be jeopardized. The determination of effect on traditional cultural properties (ethnographic resources eligible to be listed in the national register) for §106 would be *adverse effect*.

Impacts from the No-action Alternative

Under the no-action alternative, impacts on the ethnographic resources could result from trampling, unauthorized visitor access to cultural sites, vandalism, theft, and fire. There is a negligible risk of impacts resulting from traditional tribal uses of these resources.

Limited ability to enforce resource protection at Hovenweep's sites increases the potential for adverse impacts resulting from these activities. Ongoing tribal consultation would enable monument management to focus protection efforts on areas and resources of particular sensitivity, thus mitigating or avoiding adverse impacts on these resources. Implementation of alternative A could result in minor long-term or permanent adverse impacts on the monument's ethnographic resources.

Cumulative Effects. A variety of past, present, and reasonably foreseeable future actions have adversely affected ethnographic resources in the past and could adversely affect ethnographic resources both at Hovenweep National Monument and on adjacent lands in the future. Grazing, energy development on adjacent lands, archeological investigations, and the looting and vandalism of archeological sites have resulted in minor to moderate long-term or permanent adverse effects to archeological resources. Future development outside monument boundaries could also result in minor to moderate long-

term or permanent adverse impacts on such resources.

As described previously, implementation of the no-action alternative could result in minor long-term or permanent adverse impacts on ethnographic resources. The minor adverse impacts associated with the no-action alternative, in combination with the minor to moderate long-term or permanent adverse impacts of other past, present, and reasonably foreseeable future actions, would result in minor to moderate adverse cumulative impacts. However, the no-action alternative would be expected to contribute only minimally to the adverse cumulative impacts. Thus, any adverse impacts on ethnographic resources resulting from implementation of the no-action alternative would be a very small component of the minor to moderate adverse cumulative impact.

Conclusion. Implementation of the no-action alternative would result in long-term or permanent minor adverse impacts, which would be a very small component of the minor to moderate cumulative adverse impact. This alternative would not result in any unacceptable impacts as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

Section 106 Summary. After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, Assessment of Adverse Effects), the National Park Service concludes that implementation of alternative A would have no adverse effect on ethnographic resources at Hovenweep National Monument.

Impacts from the Preferred Alternative

It is reasonable to assume that increased population growth in the Four Corners region could result in additional visitation at Hovenweep National Monument. Under the preferred alternative, the focus on resource protection through enhanced visitor education and interpretation programs would limit adverse impacts resulting from increased visitation at the monument.

Developing zones for the protection of sensitive resources would enhance protection of the monument's ethnographic resources. Monument officials would work with tribal representatives to ensure appropriate levels of protection and access for these resources. Construction of the new maintenance facility would occur in a location that does not contain sensitive cultural resources and does not impose on the park's viewshed. Conservation archeological surveys could provide additional data about previously undiscovered archeological resources, which would result in long-term minor to moderate beneficial impacts on ethnographic resources. Implementation of the preferred alternative would result in negligible to minor long-term or permanent adverse impacts on ethnographic resources.

Cumulative Effects. A variety of past, present, and reasonably foreseeable future actions have affected and could in the future affect ethnographic resources at Hovenweep National Monument. Grazing, energy development on adjacent lands, archeological investigations, looting, and vandalism have all adversely affected ethnographic resources at Hovenweep.

The long-term negligible to minor adverse impacts of this alternative, in conjunction with the adverse impacts of past, present, and reasonably foreseeable future actions, would result in minor long-term adverse impacts on ethnographic resources. However, any adverse impacts on ethnographic resources resulting from implementation of the preferred alternative would be a small component of the minor to moderate adverse cumulative impact.

Conclusion. Implementation of the preferred alternative would result in long-term or permanent negligible to minor adverse impacts, which would be a very small component of the minor to moderate cumulative adverse impact. This alternative would not result in any unacceptable impacts as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

Section 106 Summary. After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, Assessment of Adverse Effects), the National Park Service concludes that implementation

of alternative B would have no adverse effect on ethnographic resources at Hovenweep National Monument.

NATURAL RESOURCES IMPACT ANALYSIS

Analysis of potential impacts on natural resources was based on research, knowledge of monument resources, and the best professional judgment of planners, biologists, hydrologists, and botanists who have experience with similar types of projects. Information on the monument's natural resources was gathered from several sources, including the U.S. Fish and Wildlife Service, Natural Resources Conservation Service, Colorado Division of Wildlife, Utah Division of Wildlife Resources, and others.

Where possible, map locations of sensitive resources were compared with the locations of proposed developments and modifications. Predictions about short-term and long-term site impacts were based on previous studies of visitor and facilities development impacts on natural resources.

SOILS

Definitions of Intensity Levels

Impacts on the soil resource were determined using knowledge of local soils and the effects of similar actions in the region. The following categories were used to evaluate the potential impacts on soils:

Negligible. The impact on soils would not be measurable. Any effects on productivity or erosion potential would be slight.

Minor. An action that would change a soil's profile in a relatively small area, but it would not appreciably increase the potential for erosion of additional soil.

Moderate. An action that would result in a change in quantity or alteration of the topsoil, overall biological productivity, or the potential for erosion to remove small quantities of additional soil. Changes to localized ecological processes would be of limited extent.

Major. An action that would result in a change in the potential for erosion to remove large quantities of additional soil or in alterations to topsoil and overall biological productivity in a relatively large area. Significant ecological processes would be altered, and landscape-level changes would be expected.

Impacts from the No-action Alternative

This alternative would not call for additional construction. There would be no new impacts on soils or biological soil crusts in the monument resulting from the no-action alternative. Impacts from past development and current use and operation of the monument would continue. These impacts include compaction or disturbance of soil layers and disruption of natural runoff patterns that affect erosion.

Cumulative Effects. Actions that have or would affect monument resources include monument development, such as utility lines, road construction, and maintenance. These actions disturb soils in such ways as compaction, porosity, and percolation of precipitation. They also increase the potential of soil loss from wind and water erosion.

There has been concentrated human activity in the Square Tower unit since it has been open to the public. Development and maintenance of monument operations and visitor service facilities (visitor center/headquarter building, residences, campground, trails, and maintenance areas) have taken place over the years.

The surrounding lands have been used for livestock grazing for more than 100 years.

Overall, the effects of these past, present, and reasonably foreseeable actions would be minor to moderate and adverse.

The no-action alternative would not contribute to these effects, and so there would

be no project-related cumulative effects on the soil resources.

Conclusion. This alternative would have no new effect on soils and no cumulative effects. This alternative would not result in any unacceptable impacts as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

Impacts from the Preferred Alternative

Implementing the preferred alternative would involve slight changes to existing development footprints, such as parking areas, toilets, and minor trail widening or realignment. Construction of the proposed maintenance facility at the Square Tower unit would disturb about 2 acres. Following NPS policies, mitigating measures reducing the potential for soil loss or erosion would be applied to any construction project. This construction is anticipated to affect about 3 acres throughout the monument resulting in long-term minor adverse impacts in the form of increased potential for erosion during construction, mixing of soil profiles, and removal of topsoil.

Archeological excavation at Goodman Point and possibly at other units would result in localized areas of soil disturbance. However, soil in and around the ruins has been disturbed by human occupation for hundreds of years, and minimum-disturbance excavation techniques would be employed, so impacts resulting from this activity would be long-term and adverse but negligible.

The actions listed above would be primarily in previously disturbed areas, so only a negligible loss of biological soil crusts would occur.

The result of implementing the actions included in this alternative would be long-term minor adverse impacts on the soil resource.

Cumulative Effects. Actions that have or will affect resources in the region include oil and gas extraction, commercial or residential development, utility lines, road construction, and maintenance. These actions disturb soils in such ways as compaction, porosity, and percolation of precipitation. They also increase the potential of soil loss from wind and water erosion.

There has been concentrated human activity in the Square Tower unit since it has been open to the public. Development and maintenance of monument operations and visitor service facilities (visitor center/headquarter building, residences, campground, trails, and maintenance areas) have taken place over the years. Impacts from existing roads and developments in the park would continue.

The surrounding lands have been used for livestock grazing for more than 100 years. These activities have caused adverse impacts on soils and soil crusts to varying degrees. Overall, the effects of these past, present, and reasonably foreseeable actions is minor to moderate and adverse.

The preferred alternative would result in a long-term minor adverse impact. When the impacts of this alternative are combined with the effects of other past, present, and future actions, there would be minor to moderate adverse cumulative effects. Alternative B would make up a small contribution to the overall effects.

Conclusion. This alternative would have long-term minor adverse impacts on soils and a long-term negligible adverse impact on soil crusts. Cumulative effects would be minor to moderate and adverse. This alternative would not result in any unacceptable impacts to soils as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

VEGETATION

Methodology

Information on site-specific areas was gleaned from other documents and results of biological surveys. Anticipated impacts were deduced from similar actions taken in the area along with site-specific information.

Definition of Intensity Levels

Negligible. The impact on vegetation (individuals and/or communities) would not be measurable. The abundance or distribution of individuals would not be affected or would be slightly affected. Ecological processes and biological productivity would not be affected.

Minor. An impact would not necessarily decrease or increase the area's overall biological diversity and nativity. An impact would affect the abundance or distribution of individuals in a localized area but would not affect the viability of local or regional populations or communities.

Moderate. The impact would result in a change in overall biological diversity and nativity in a small area. An impact would affect a local population sufficiently to cause a change in abundance or distribution, but it would not affect the viability of the regional population or communities. Changes to ecological processes would be of limited extent.

Major. The impact would result in a change in overall biological diversity and nativity in a relatively large area. The action would affect a regional or local population of a species sufficiently to cause a change in abundance or in distribution to the extent that the population or communities would not be likely to return to its/their former level (adverse), or would return to a sustainable level (beneficial). Important ecological processes would be altered.

Impacts from the No-action Alternative

There would be no ground disturbance or other major changes resulting from

implementing this alternative, so there would be no new effects on vegetation. There would be no changes in the current status of vegetative species composition other than those brought about by ongoing environmental processes. Impacts from existing monument development would continue, such as disruption of native plant communities.

Management programs for nonnative species would continue according to other park planning.

Cumulative Effects. Native vegetation in the region has been somewhat disturbed for thousands of years. From early American Indian cultures through the present, humans relied on the vegetation for food, fuel, and animal feed. When white settlers came into the region, nonnative plants came with them. These actions altered the vegetation in relatively small areas throughout much of the region.

More recently, development and maintenance of various facilities (visitor center/headquarter building, residences, campground, trails, and maintenance areas) have taken place at the Square Tower unit over the years. The surrounding lands have been used for livestock grazing for more than 100 years. Some of the native woodland in or around all units has been modified by hundreds of years of human occupation and use. These activities have led to long-term minor to moderate adverse impacts on native vegetation communities.

Seeds of nonnative plants carried by wind and humans have introduced noxious weeds and other invasive species in disturbed areas that cause long-term adverse effects on native vegetation.

The establishment of Hovenweep National Monument has resulted in long-term beneficial impacts on vegetation through protection of native communities and efforts to eradicate nonnative species.

The no-action alternative would have no contribution to these impacts, so there would be no project-related cumulative effect on vegetative resources.

Conclusion. Implementing the no-action alternative would have no new impact on native vegetation and no cumulative effects. This alternative would not result in any unacceptable impacts as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

Impacts of the Preferred Alternative

Some adverse impacts on vegetation would be expected as a result of implementing the preferred alternative. Construction of a maintenance facility in the Square Tower unit would impact about 2 acres. There would be slight changes to existing development footprints in outlying units (such as clearing parking areas or replacing pit toilets with vault toilets) that would affect vegetation under this alternative. This construction would disturb or destroy a total of about 3 acres (or 0.4% of the monument) of vegetation, resulting in long-term minor adverse impacts.

Archeological investigation that involves excavation would disturb or destroy existing vegetation. However, because this would occur in second-growth vegetation in previously disturbed areas, the impacts would be long-term and adverse but negligible.

Wetland communities associated with major springs would receive protection by placement in the Sensitive Resources zone, resulting in long-term minor beneficial impacts.

Cumulative Effects. Native vegetation in the region has been somewhat disturbed for thousands of years. From early American Indian cultures through the present, humans relied on the vegetation for food, fuel, and animal feed. When white settlers came into the region, nonnative plants came with them. These activities have adversely altered the vegetation throughout much of the region. More recently, development and maintenance of various facilities (visitor center/ headquarters building, residences,

campground, trails, and maintenance areas) have taken place at the Square Tower unit over the years and destroyed some native vegetation. The surrounding lands have been used for livestock grazing for more than 100 years, which has adversely affected native vegetation. Some of the native woodland in or around all units has been modified by hundreds of years of human occupation and use. These activities have adversely impacted vegetation communities to varying degrees.

Seeds of nonnative plants carried by wind and humans have introduced noxious weeds and other invasive species in disturbed areas that cause long-term adverse effects on native vegetation. Overall, the effects of these past, present, and reasonably foreseeable future actions are minor to moderate and adverse.

The establishment of Hovenweep National Monument has resulted in long-term beneficial impacts on vegetation through protection of native communities and nonnative species eradication efforts.

Implementation of this alternative would result in a long-term minor adverse component to these impacts. The resulting effect of all past, present, and future actions, when considered cumulatively with the impacts of this alternative, would be minor and adverse. Alternative B would provide a small contribution to the overall effects.

Conclusion. The preferred alternative would have long-term minor adverse impacts on native vegetation. Cumulative effects would be minor and adverse. This alternative would not result in any unacceptable impacts to vegetation as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

WILDLIFE

Methodology

Impacts on wildlife are closely related to the impacts on habitat. The evaluation considered whether actions would be likely to displace some or all individuals of a species in the monument or would result in loss or creation

of habitat conditions needed for the viability of local or regional populations. Impacts associated with wildlife might include any change in roosting or foraging areas, food supply, protective cover, or distribution or abundance of species.

Definition of Intensity Levels

Negligible. The impact would not be measurable on individuals, and the local populations would not be affected.

Minor. The impact would affect the abundance or distribution of individuals in a localized area but would not affect the viability of local or regional populations.

Moderate. The impact would affect a local population sufficiently to cause a minor change in abundance or distribution but would not affect the viability of the regional population.

Major. The impact would affect a regional or local population of a species sufficiently to cause a change in abundance or in distribution to the extent that the population would not be likely to return to its former level (adverse), or would return to a sustainable level (beneficial).

Impacts from the No-action Alternative

The no-action alternative would not result in any change in conditions affecting wildlife populations or their habitat. Existing conditions and situations would continue without changes in plant or wildlife management. Impacts on wildlife, such as displacement and habitat fragmentation from existing use and development of the monument would continue. There would be no additional changes in the current condition of wildlife communities either in terms of species composition or population dynamics other than those brought about by natural environmental processes as a result of this alternative.

Cumulative Effects. Regional wildlife populations have been historically affected by agriculture, commercial activities, and

residential land uses. There have been subsequent minor to moderate adverse impacts in the form of habitat loss or disruption associated with these uses. Intentional and unintentional vegetation modifications and livestock grazing have adversely affected wildlife by impacting habitat and available forage.

Establishment of Hovenweep National Monument has resulted in long-term beneficial impacts on wildlife by preserving these small areas of habitat. Establishment of the Canyon of the Ancients National Monument also contributes to habitat preservation and connections in the region.

Because this alternative would not contribute to the impacts of other past, present, and reasonably foreseeable future actions, there would be no project-related cumulative impacts on wildlife populations, were this alternative to be implemented.

Conclusion. Implementing the no-action alternative would have no new effect on wildlife populations, and there would be no project-related cumulative impacts. This alternative would not result in any unacceptable impacts as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

Impacts from the Preferred Alternative

Implementing the preferred alternative would result in a slight increase in the amount of disturbed area in the monument from the construction of a new maintenance facility in the Square Tower unit and other minor construction in the outlying units (totaling approximately 3 acres). This would result in a temporary and highly localized increase in noise and human activity that could cause displacement of individuals—a short-term minor adverse impact. The changes to existing facilities would occur in or near disturbed areas that do not provide quality habitat and would have a long-term negligible adverse impact on wildlife.

The slight increase in visitation expected under this alternative could lead to additional

adverse impacts on wildlife near trails and parking areas. This impact would be long term, negligible, and adverse.

Most springs and associated wetlands would be protected by placement in the Sensitive Resources zone. This would benefit wildlife that use these habitat features.

Impacts from this alternative would be long term and adverse but negligible.

Cumulative Effects. Regional wildlife populations have been affected by agriculture, commercial activities, and mineral extraction over the last 100 to 150 years. There has been subsequent minor to moderate adverse impacts in the form of habitat loss or disruption associated with these uses. Intentional and unintentional vegetation modifications and livestock grazing have adversely affected wildlife by degrading habitat and reducing available forage. Continued suburban sprawl could begin to adversely impact wildlife near the Goodman Point unit, the closest to an urban area. Establishment of Hovenweep National Monument has resulted in long-term beneficial impacts on wildlife by preserving small areas of habitat. The designation of the Canyon of the Ancients National Monument also contributes to habitat preservation in the region. However, the presence of these monuments has attracted more visitors to the region, which adversely affects wildlife through disturbance or displacement of individual animals.

Implementation of this alternative would result in a long-term negligible adverse impact. The resulting effect of other past, present, and future impacts, when considered together with the impacts of this alternative, would be minor and adverse. This alternative would make up a slight contribution to the overall cumulative effects.

Conclusion. Implementing the preferred alternative would have a short-term minor adverse affect and a long-term negligible adverse effect on wildlife populations. The cumulative effects would be minor and

adverse. This alternative would not result in any unacceptable impacts to wildlife as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

SPECIAL STATUS SPECIES

Methodology

Through coordination with the U.S. Fish and Wildlife Service, species of special concern were identified that were generally located in or near the monument. This included information on each species, including their preferred habitat, prey, and foraging areas. For special status species, the following impact intensities were used. These definitions are consistent with the language used to determine effects on threatened and endangered species under section 7 of the Endangered Species Act.

Definition of Intensity Levels

No effect: The action would have no effect on the special status species or critical habitat.

Not likely to adversely affect. The action would be expected to result in discountable effects on a species or critical habitat (that is, unlikely to occur and not able to be meaningfully measured, detected, or evaluated), or it would be completely beneficial.

Likely to adversely affect. The action would result in a direct or indirect adverse effect on a species or critical habitat, and the effect would not be discountable or completely beneficial.

Impacts from the No-action Alternative

This alternative would continue current management of the monument with no changes in plant or wildlife management. No changes in park development or visitor use are anticipated to occur and, therefore, no additional habitat for special status species would be impacted.

Existing conditions and situations would continue. Impacts from existing use and development in the monument such as habitat

fragmentation would continue. This alternative would not result in any change in situations or conditions affecting peregrine falcons or northern goshawks.

Inventory and monitoring of state-listed and federally listed species would continue and protective measures would be implemented when necessary. This alternative would have no effect on federal or state special status species.

Cumulative Effects. Habitat loss or disruption is the most common reason for a terrestrial wildlife or plant species to become threatened or endangered. Loss or fragmentation of habitat has occurred in the region as a result of livestock operations and mineral extraction. Certain actions taken on private, state, and federal land can disrupt or fragment habitat, displace individuals, or otherwise cause stress to animals. Incremental development of the region has changed the capacity of habitats to provide necessary food, shelter, and territory, resulting in stress on populations. Because the monument is in a relatively remote region, these past and present impacts on threatened and endangered species from human activities have been adverse but minor.

In the Four Corners region, lands set aside as national parks and monuments and designated wilderness, or through other protective regulations have benefited rare wildlife and plants by preserving important habitat. However, the presence of national parks and monuments could attract more visitors to the region, which would adversely affect wildlife through disturbance or displacement of individual animals.

Because this alternative would not contribute to the impacts of other past, present, and reasonably foreseeable future actions, there would be no project-related cumulative impacts on listed, candidate, or other special status species.

Conclusion. Implementing the no-action alternative would have no effect on federal

and state species of concern and no project-related cumulative effect. This alternative would not result in any unacceptable impacts as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

Impacts from the Preferred Alternative

The minor changes in park development from implementing the preferred alternative would not occur in habitat critical to, or known to be used by, any of the special status species. Construction related to the new maintenance facility and the other minor projects would result in a temporary and highly localized increase in noise and human activity that could cause displacement of individuals during certain seasons. This activity would occur in areas that have been previously disturbed and thus, provide lower quality habitat. The impacts would be short-term, minor, and adverse.

The slight increase in visitation that could occur under this alternative would take place in areas that already receive public visitation, so it is not anticipated to affect the sensitive species.

No change from the current status of the peregrine falcon or northern goshawk would result from implementation of this alternative. This alternative would result in no changes in plant or wildlife management. Inventory and monitoring of state and federally listed species would continue and protective measures implemented when necessary.

This alternative would have no effect on federal or state special status species.

Cumulative Effects. Habitat loss or disruption is the most common reason for a terrestrial wildlife or plant species to become threatened or endangered. Loss or fragmentation of habitat has occurred in the region as a result of livestock operations and mineral extraction. Certain actions taken on private, state, and federal land can disrupt or fragment habitat, displace individuals or otherwise cause stress to animals. Incremental development of the region has changed the capacity of habitats to provide necessary food, shelter, and territory, resulting in stress on

populations. Because the monument is in a relatively remote region, these past and present impacts on threatened and endangered species from human activities have been adverse but minor.

In the Four Corners region, lands set aside as national parks and monuments, as designated wilderness, or under other protective regulations have benefited rare wildlife and plants by preserving important habitat. However, the presence of national parks and monuments could attract more visitors to the region, which would adversely affect wildlife through disturbance or displacement of individual animals. The short-term minor adverse impacts of this alternative, when combined with the impacts of other past, present and reasonably foreseeable future actions, would result in minor adverse cumulative impacts on listed, candidate, or other special status species. The preferred alternative would contribute a very slight amount to the overall cumulative effects.

Conclusion. Implementing the preferred alternative could affect but is not likely to adversely affect any federal and state species of concern. There would be minor adverse cumulative impacts, but this alternative would create only a very slight contribution. This alternative would not result in any unacceptable impacts to special status species as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

VIEWSHEDS

Methodology

The impact intensity of a development on a viewshed depends on the type of development, its location, and what mitigative measures are applied. For example, a development in the foreground of a viewshed has a much larger impact than the same development located 3 miles distant. Mitigation could include an unobtrusive design or color. All three factors are evaluated together to determine the level of impact a proposed development would have.

For the purposes of this analysis, a viewshed is defined as the landscape seen from key observation points identified in the Affected Environment chapter of this plan. The foreground is defined as that part of the viewshed from the observation point to the first horizon/line of sight (e.g., a ridgetop) or a line 2 miles away, whichever is closer. Middleground is that part of the viewshed that is between 2 and 5 miles from the observation point. The background is everything more than 5 miles from the observation point.

Intensity of Impact—Definitions

Assessments of potential impacts on viewsheds were based on comparisons between the no-action alternative and the action alternative. The following intensity definitions were used.

Negligible. The action would not detract from existing natural views; proposed development in the foreground, middleground, or background would be essentially unnoticeable.

Minor. The action would be noticeable to some observers but would not detract from natural views. There could be small changes to existing form, line, texture, or color in the background.

Moderate. The action would be noticeable to most observers and could detract from natural views in a limited portion of a viewshed. There could be modest changes to existing form, line, texture, or color in the middle ground or background.

Major. The action would be immediately noticeable and would detract from the natural setting in a majority of a viewshed. It would result in large changes to existing form, line, texture, or color in the foreground, middle ground, or background; or portions of the natural view would be obstructed.

Impacts from the No-action Alternative

Implementing this alternative would not result in any changes to the monument's viewsheds. There would be no cooperative management to protect external vistas in the future initiated under this alternative. This could have potential long-term moderate adverse impacts on natural views.

Cumulative Effects. Human-caused impacts on natural viewsheds are primarily confined to developed portions of the Square Tower unit. Natural landscapes in this area are affected by development to support monument operations or visitor use, such as the visitor center, roads, trails, the campground, and a proposed maintenance facility.

Currently, there are very few modern impacts on the natural setting as seen from the back of the visitor center, with the exceptions of the trail and a power transmission line.

This alternative would not contribute to the impacts of other past, present, and reasonably foreseeable future actions. There would be no project-related cumulative effects on views.

Conclusion. The no-action alternative would have no impacts on natural viewsheds in the monument. There would be no project-related cumulative effects. This alternative would not result in any unacceptable impacts as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

Impacts from the Preferred Alternative

Implementing this alternative would involve construction of a new maintenance facility in the Square Tower unit. The structure would be carefully placed and other mitigative measures would be applied. The resulting impact of this structure would be long term, minor, and adverse. There would be no effect on the Goodman Point viewshed.

Cumulative Effects. Human-caused impacts on viewsheds within the monument are primarily confined to developed portions of the Square Tower unit. Natural landscapes in this area are affected by development to support monument operations or visitor use, such as the visitor center, roads, trails, the campground, and a proposed maintenance facility.

The park would work cooperatively with landowners and other entities to protect viewsheds.

This alternative would contribute moderate beneficial and minor adverse components to

the impacts of other past, present, and reasonably foreseeable future actions. The resulting cumulative effects on viewsheds would be minor to moderate and adverse. This alternative's contribution would be small.

Conclusion. The preferred alternative would result in minor adverse and moderate beneficial impacts on natural viewsheds in the monument. The cumulative effects would be minor to moderate and adverse. This alternative would not result in any unacceptable impacts as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

NIGHT SKIES

Methodology

The impact intensity of a development on night skies depends on the type of development, its location, type of artificial light used, and what mitigative measures are applied. For example, lighting in the foreground of a viewshed has a much larger impact than the same development with associated lighting located a few miles distant. Mitigation could include indirect lighting, shading, or unobtrusive lighting design. All these factors would be evaluated to determine the level of impact that lighting might have on night skies.

Intensity of Impact—Definitions

Assessments of potential impacts on night skies were based on comparisons between the no-action alternative and the action alternative. The following intensity definitions were used.

Negligible. The action would not detract from the existing quality of night skies. Artificial lighting in the foreground, middleground, or background would be essentially unnoticeable.

Minor. The action would be noticeable to some observers but would not detract from natural views. There could be small changes to existing lighting patterns in the background.

Moderate. The action would be noticeable to most observers and could detract from natural

night sky views in the middleground or background.

Major. The action would be immediately noticeable and would detract from the natural night sky views in the foreground, middleground, or background.

Impacts from the No-action Alternative

Implementing this alternative would not result in any changes to the monument's views of the night sky. There would be no cooperative management initiated to protect external views of the night sky from artificial light in the future. This could have potential long-term minor adverse impact on night skies.

In this alternative, human-caused impacts on the monument's night skies would primarily be confined to developed portions of the Square Tower unit. Natural night sky landscapes in this area would be affected by development to support monument operations or visitor use, such as the visitor center and the campground.

Cumulative Impacts. Artificial light at Hovenweep emanates from past and present development at the Square Tower unit. Other past, present, and reasonably foreseeable actions that could affect night skies include energy development on private lands adjacent to the monument, residential and commercial development adjacent to or near the unit as well as on the outskirts of the city of Cortez, and improved lighting on local highways. The actions under this alternative would contribute a small adverse component to the overall potential cumulative long-term minor to moderate adverse impact on night skies.

Conclusion. The no-action alternative would have a long-term minor adverse impact on night skies in the monument. This alternative would contribute a small adverse component to potential cumulative impacts on night skies. This alternative would not result in any unacceptable impacts as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

Impacts from the Preferred Alternative

Implementing the preferred alternative would involve construction of a new maintenance

facility in the Square Tower unit. Required lighting to meet health, safety, and security guidelines for the facility and parking area could pose adverse impacts on views of the night sky from the Square Tower unit. Best management practices involving careful design and placement of lighting would minimize the impacts of lighting on the night sky. The resulting impact of this structure would be long-term, negligible to minor, and adverse.

The use of tools such as those listed in Table 5 to protect views of the night sky would be initiated under this alternative. This would result in long-term minor to moderate beneficial impacts on night sky views.

Cumulative Impacts. Artificial light at Hovenweep emanates from past and present development at the Square Tower unit. Other past, present, and reasonably foreseeable actions that could affect night skies include energy development on private lands adjacent to the monument, residential and commercial development on the outskirts of the city of Cortez, and improved lighting on local highways. The park would work cooperatively with landowners and other entities to reduce the potential for intrusions in the night sky.

The actions under the preferred alternative would contribute a small minor beneficial component to the overall potential cumulative long-term minor to moderate adverse impacts on night skies.

Conclusion. The preferred alternative would have a long-term negligible to minor adverse impact and a minor beneficial impact on night skies in the monument. These impacts would comprise a small component to the overall long-term minor to moderate adverse cumulative impacts. This alternative would not result in any unacceptable impacts as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

SOUNDSCAPES

Methodology

Context, time, and intensity together determine the level of impact for an action. For

example, noise for a certain period and intensity would be a greater impact in a highly sensitive context, and a given intensity would be a greater impact if it occurred more often, or for longer duration. It is usually necessary to evaluate all three factors together to determine the level of noise impact. In some cases an analysis of one or more factors might indicate one impact level, while an analysis of another factor might indicate a different impact level, according to the criteria identified below. In such cases, best professional judgment based on a documented rationale must be used to determine which impact level best applies to the situation being evaluated.

Intensity of Impact—Definitions

Assessments of potential impacts on soundscapes were based on comparisons between the no-action alternative and the action alternative. The following intensity definitions were used.

Negligible. Natural sounds would prevail; human-caused noise would be absent or very infrequent and mostly immeasurable.

Minor. Natural sounds would predominate in zones where management objectives call for natural processes to predominate, with human-caused noise infrequent at low levels. In zones where human-caused noise is consistent with park purpose and objectives, natural sounds could be heard occasionally.

Moderate. In zones where management objectives call for natural processes to predominate, natural sounds would predominate, but human-caused noise could occasionally be present at low to moderate levels. In areas where human-caused noise is consistent with park purpose and objectives, it would predominate during daylight hours and would not be overly disruptive to noise-sensitive visitor activities in the area; in such areas, natural sounds could still be heard occasionally.

Major. In zones where management objectives call for natural processes to predominate, natural sounds would be impacted

by human-caused noise sources frequently or for extended periods of time. In zones where human-caused noise is consistent with park purpose and zoning, the natural soundscape would be impacted most of the day; noise would disrupt conversation for long periods of time and/or make enjoyment of other activities in the area difficult; natural sounds would rarely be heard during the day.

Impacts from the No-action Alternative

Implementation of this alternative would not result in any changes to soundscapes within the monument. Human-related noise would continue during high visitation periods around the visitor center and major trails in the Square Tower unit. It is anticipated that the current pattern and level of visitation would not change appreciably and that human-related noise in all areas of the park would not change from existing levels as a result of implementing the no-action alternative.

Cumulative Effects. Human-caused sounds in the monument are primarily confined to developed areas, such as at Square Tower, and near major roads. Natural soundscapes in the areas near the visitor center, main trails, and the campground are affected by intermittent noises as a result of visitor use, such as vehicle engines, doors closing, and voices.

For the most part, natural soundscapes continue to prevail in the outlying units. Because this alternative would not contribute to the impacts of other past, present, and reasonably foreseeable future actions, there would be no cumulative impacts on the monument's soundscapes.

Conclusion. The no-action alternative would have no effect on natural soundscapes in the monument, and there would be no cumulative effects. This alternative would not result in any unacceptable impacts as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

Impacts from the Preferred Alternative

The level of human-related noise would increase slightly at the Square Tower, because visitation is anticipated to increase at this unit. The sources of noise would be the same as those existing (vehicles starting and stopping, car doors, voices), but more people would increase the intensity, or decibel level, during busy periods. The impact to natural soundscapes would be long-term negligible and adverse.

It is expected that visitation numbers and patterns would not increase substantially at the outlying units. Therefore, noise levels would remain unchanged, and there would be no impacts on natural soundscapes at the outlying units of the monument.

The minor construction called for in this alternative would cause short-term minor to moderate adverse impacts on localized soundscapes. These impacts would cease once construction was completed.

Cumulative Effects. Human-caused sounds in the monument are primarily confined to developed areas, such as at Square Tower, and near major roads. Natural soundscapes in the

areas near the visitor center, main trails, and the campground are affected by intermittent noises as a result of visitor use, such as vehicle engines, doors closing, and voices. However, these areas are placed in zones that allow more human-related noise to occur. Overall, there would be minor adverse impacts on the soundscapes.

This alternative would result in a long-term negligible adverse impact. When the effects of this alternative are combined with the effects of other past, present, and reasonably foreseeable future actions, there would be minor adverse cumulative impacts on the monument's soundscapes. This alternative would contribute modestly to the overall effects.

Conclusion. Implementing the preferred alternative would result in short-term minor to moderate adverse impacts and long-term negligible adverse impacts on natural soundscapes in the monument. The cumulative effects would be minor and adverse. This alternative would not result in any unacceptable impacts as outlined in §1.4.7.1 of *NPS Management Policies 2006*.

VISITOR USE AND UNDERSTANDING IMPACT ANALYSIS

METHODOLOGY

This impact analysis considers various aspects of visitor use and experience at Hovenweep National Monument, including the effects on visitors' ability to experience the monument's primary resources and their natural and cultural settings (including vistas, natural sounds and smells, and wildlife); overall visitor access to the park; freedom to experience the resources at one's own pace; and opportunities for people with disabilities. The analysis is based on how visitor use and experiences would change with the way management prescriptions were applied in the alternatives. The analysis is primarily qualitative rather than quantitative, owing to the conceptual nature of the alternatives.

Impacts on visitor use and experience were determined by considering the best available information. Information on visitor use and visitor opinions was taken primarily from a visitor study conducted at Hovenweep during the fall of 1999 and spring of 2000 by Northern Arizona University (Delost and Lee 2000). This information was supplemented by data gathered during this planning process, including opinions from visitors and neighbors and information provided by monument staff.

For analysis purposes, impact duration, type, and intensity of visitor experience have been defined as follows:

Definitions

Duration of Impact. A short-term impact would last no more than one overnight visit (about 24 hours). A long-term impact would last two days or more.

Type of Impact. Adverse impacts are those that most visitors would perceive as undesirable. Beneficial impacts are those that most visitors would perceive as desirable.

Intensity of Impact. Impacts were evaluated comparatively between alternatives, using the

no-action alternative as a baseline for comparison with the action alternative:

Negligible. Visitors would likely be unaware of any effects associated with implementation of the alternative.

Minor. Changes in visitor use or experience would be slight but detectable, would affect few visitors, and would not appreciably limit or enhance experiences identified as fundamental to the park's purpose and significance.

Moderate. Some characteristics of visitor use or experience would change, and many visitors would likely be aware of the effects associated with implementation of the alternative; some changes to experiences identified as fundamental to the monument's purpose and significance would be apparent.

Major. Multiple characteristics of visitor experience would change, including experiences identified as fundamental to monument purpose and significance; most visitors would be aware of the effects associated with implementation of the alternative.

IMPACTS FROM THE NO-ACTION ALTERNATIVE

The level and pattern of visitor use would not change as a result of implementing the no-action alternative. Existing visitor service programs and facilities (visitor center, restrooms, trails, and campground) would remain.

Visitors would continue to gain understanding and appreciation of the monument's primary resources through site bulletins and brochures, visitor center exhibits, and wayside interpretive signs. Opportunities for self-guided exploration would continue at all units. Occasional ranger-led activities would be available at the Square Tower unit during certain times of the year. The staff at

Hovenweep would continue to offer opportunities for high-quality visitor experiences to the best of their ability and funding.

With no change to existing programs and services, this alternative would have no new effect on visitor use and understanding.

Cumulative Effects. While there are numerous opportunities to see the remains of past cultures in the Four Corners region, each of the federally managed sites showcases a different manifestation of these early American Indian societies. Hovenweep offers a more undeveloped, quieter experience than other sites, and therein is its appeal.

Some factors affecting the experience of park visitors are out of NPS control. High fuel prices, availability of lodging, and the weather can adversely affect a vacation experience more so than the facilities or staff at a national park site.

The no-action alternative would not change visitor experiences, and so there would be no cumulative effects associated with this alternative.

Conclusion. The no-action alternative would have no effect on visitor use and understanding and no project-related cumulative effects.

IMPACTS FROM THE PREFERRED ALTERNATIVE

The level and patterns of visitor use could change as a result of implementing this alternative. As the public learns of the improved interpretation and educational programs, visitation could increase. Interpretation would be enhanced to include more information on surrounding sites that are related to Hovenweep. This would increase the level of visitor satisfaction, because they could learn about and visit additional sites in the area.

Visitors would gain an understanding and appreciation of the monument's resources

through site bulletins, visitor center exhibits, and wayside interpretive signs. Visitors would receive a good understanding of the monument's story by visiting just the Square Tower unit. Subsequent visits to outlying units would reinforce and broaden understanding of the story. Expanded opportunities for high quality, self-guided exploration would continue to be available. Occasional ranger-led activities would be available at the Square Tower unit during certain times of the year.

Enhancement of existing programs and services in this alternative would lead to an increased level of visitor satisfaction, which would be a long-term minor beneficial impact on visitor use and understanding.

Cumulative Effects. Although there are numerous opportunities to see the remains of past cultures in the Four Corners region, each of the federally managed sites showcases different manifestations of early American Indian societies. Hovenweep offers a more undeveloped, quieter experience than other sites, and therein is its appeal.

External factors affecting the experience of park visitors are out of NPS control. High fuel prices, availability of lodging, and the weather can adversely affect a vacation experience more so than the facilities or staff at a national park site. The staff at Hovenweep continues to offer opportunities for high-quality visitor experiences to the best of their ability and funding.

Implementing this alternative would result in minor beneficial impacts, and when combined with the effects of other past, present, and future actions, this alternative would result in negligible beneficial cumulative effects. This alternative would contribute modestly to the overall effects.

Conclusion. Implementation of the preferred alternative would result in a long-term minor beneficial impact on visitor use and understanding. The cumulative effects would be negligible and beneficial.

SOCIOECONOMIC ENVIRONMENT IMPACT ANALYSIS

METHODOLOGY

The National Park Service applied logic, experience, professional expertise, and professional judgment to analyze the impacts on the social and economic situation resulting from the implementation of each alternative. Economic data, historic visitor use data, expected future visitor use, and future developments of the national monument were all considered in identifying, discussing, and evaluating expected impacts.

Intensity of Impact

Assessments of potential socioeconomic impacts were based on comparisons between the no-action alternative and the action alternative. The following intensity definitions were used:

Negligible. Effects on socioeconomic conditions would be at or below the level of detection. There would be no noticeable change in any defined socioeconomic indicators.

Minor. Effects on socioeconomic conditions would be slight but detectable.

Moderate. Effects on socioeconomic conditions would be readily apparent and result in changes to socioeconomic conditions on a local scale.

Major. Effects on socioeconomic conditions would be readily apparent, resulting in demonstrable changes to socioeconomic conditions throughout the region.

IMPACTS FROM THE NO-ACTION ALTERNATIVE

Implementing the no-action alternative would not affect the regional economy or social conditions. Current direct and indirect support of the local economy by operation and visitation of the monument would

continue. There would be no appreciable changes to NPS employment or expenditures. The average time of visit or length of stay in the region would not likely change. The public would continue to be able to enjoy the monument in the current manner.

Cumulative Effects. The social and economic situation in the two-county area is affected by a combination of many factors. There are a number of cultural sites in the area, including the Anasazi Heritage Center, Crow Canyon Archaeological Center, the Four Corners Monument, and Canyons of the Ancients National Monument. There also is a variety of recreational opportunities, including hiking, mountain biking, fishing, and boating at nearby reservoirs. Public participation in these activities results in a substantial beneficial contribution to local service-related businesses.

The presence of Hovenweep and other National Park Service sites, such as Mesa Verde National Park, also contributes to the attraction of the region, which serves the livelihood of tourist-related businesses. Many businesses in Cortez rely to some degree on the inflow of tourist dollars, especially restaurants, stores, and other similar businesses. This type of business is growing, as evidenced by the new motels and restaurants that have been built in the area.

Implementation of this alternative would not result in any change to social or economic conditions and so would have no contribution to other effects. Thus, there would be no project-related cumulative effects.

Conclusion. Implementation of the no-action alternative would have no effect on socioeconomic conditions in the region and no cumulative effect.

IMPACTS FROM THE PREFERRED ALTERNATIVE

Implementing the preferred alternative would have an effect on the regional economy. The National Park Service would most likely hire additional employees to handle the increased need for interpretation and research coordination. This would translate into a local increase in demand for housing, utilities, services, and goods—a long-term minor beneficial impact to the local economy. In addition, the National Park Service would contract out construction of the additional office space and vault toilets called for in the alternative, resulting in a short-term minor beneficial impact.

The number of visitors and length of season could increase when interpretive programming is enhanced. Businesses that rely on the tourist trade would receive a long-term, minor benefit. For example, if visits to the monument increased by 10%, about \$132,000 would be added to the local economies of San Juan and Montezuma counties.

Implementing this alternative would result in short-term and long-term minor beneficial impacts on the economy of the region.

Cumulative Effects. The social and economic situation in the two-county area is affected by a combination of many factors. There are a

number of cultural sites in the area, including Mesa Verde National Park, the Anasazi Heritage Center, Crow Canyon Archaeological Center, the Four Corners Monument, and Canyons of the Ancients National Monument. There also is a variety of recreational opportunities including hiking mountain biking, fishing, and boating at nearby reservoirs.

The presence of Hovenweep and other National Park Service sites contributes to the attraction of the region, which serves the livelihood of service-related businesses. Many businesses in Cortez rely to some degree on the inflow of tourist dollars, especially restaurants, motels, and gift shops. This type of business is growing, as evidenced by the new motels and restaurants that have appeared over the last few years.

This alternative would result in a minor beneficial change to social or economic conditions. Other past, present, and future actions, when combined with the small contributions of this alternative, would result in minor beneficial cumulative effects.

Conclusion. Implementing the preferred alternative would result in short-term and long-term minor beneficial impacts on socioeconomic conditions in the region. The cumulative effects would be minor and beneficial.

MONUMENT OPERATIONS IMPACT ANALYSIS

METHODOLOGY

The National Park Service applied logic, experience, professional expertise, and professional judgment to analyze the impacts on monument operations resulting from the implementation of each alternative. Economic data, historic visitor use data, expected future visitor use, and future developments of the national monument were all considered in identifying, discussing, and evaluating expected impacts.

Intensity of Impact

Assessments of potential impacts on monument operations were based on comparisons between the no-action alternative and the action alternative. The following intensity definitions were used:

Negligible. Effects on monument operations would be at or below the level of detection, and would not have an appreciable effect on monument operations.

Minor. The effects on monument operations would be detectable but would be of a magnitude that would not have an appreciable effect on park operations.

Moderate. The effects on monument operations would be readily apparent and result in substantial changes to monument operations in a manner noticeable to staff and the public.

Major. The effects on monument operations would be readily apparent and would result in substantial changes in monument operations that would be noticeable to staff and the public and be markedly different from existing conditions.

Type of Impact

Beneficial impacts would improve NPS operations and/or facilities. Adverse impacts would negatively affect NPS operations

and/or facilities and could hinder the staff's ability to provide adequate services and facilities to visitors and staff. Some impacts could be beneficial for some operations or facilities and adverse or neutral for others.

IMPACTS FROM THE NO-ACTION ALTERNATIVE

Implementing the no-action alternative would not affect current monument operations. Park maintenance staff would continue to operate out of existing facilities. No new visitor, maintenance, or administrative facilities would be built. No additional parking would be provided at any of the monument units. No additions would be made to the monument's existing trail system. Existing cooperative, interagency, and general agreements for cultural and natural resource protection, research, collections storage, shared law enforcement, office space, and outdoor education would remain in place.

Cumulative Effects. Monument operations have been affected by a number of past actions and are affected by other ongoing actions. The construction of a new visitor center and administrative facility has enhanced staff ability to provide appropriate orientation for visitors to the monument. This facility also contributed to improved communication and overall efficiency of the monument's staff.

The actions of other federal, state, and local agencies operating under the existing agreements have enhanced the ability of monument staff to provide for adequate resource protection, collections storage, law enforcement, emergency operations, and other operational requirements. Other outside actions, such as the establishment of the Four Corners School of Outdoor Education, and the creation of the Anasazi Heritage Center (BLM), have also enhanced staff efficiency and overall monument operations. Overall, these past and present actions would

contribute a long-term, minor to moderate, beneficial cumulative component to monument operations. There are no foreseeable actions that pose impacts on monument operations.

Implementation of this alternative would continue to have a long term, minor, beneficial impact on monument operations. Past and present actions would contribute an overall long-term, minor, beneficial component to these actions. There are no reasonably foreseeable actions that would contribute to cumulative impacts on monument operations.

Conclusion. Implementation of the no-action alternative would have a long-term, minor to moderate, beneficial impact on monument operations. Other outside actions would contribute a long-term minor beneficial component to monument operations.

IMPACTS FROM THE PREFERRED ALTERNATIVE

Under the preferred alternative, a new maintenance facility would be constructed at the Square Tower unit. Additional parking would be provided at the Goodman Point unit, and improvements would be made to other parking areas at other units. Small improvements would be made to trails, and informational signs throughout the monument. Existing cooperative, interagency, and general agreements for cultural and natural resource protection, research, collections storage, shared law enforcement, office space, and outdoor education would remain in place. Overall, these actions would result in a long-term moderate to major beneficial impact on monument operations.

Cumulative Effects. Monument operations have been affected by a number of past actions and are affected by other ongoing actions. The construction of a new visitor center and administrative facility has enhanced staff ability to provide appropriate orientation for visitors to the monument. This facility also has contributed to improved communication and overall efficiency of the monument's staff.

The actions of other federal, state, and local agencies operating under the existing have enhanced the ability of monument staff to provide for adequate resource protection, collections storage, law enforcement, emergency operations, and other operational requirements. Other outside actions, such as the establishment of the Four Corners School of Outdoor Education, and the creation of the Anasazi Heritage Center (BLM), have also enhanced staff efficiency and overall monument operations. Overall, these past and present actions would contribute a long-term minor beneficial cumulative component to monument operations.

Implementation of the preferred alternative would have a long term, moderate to major, beneficial impact on monument operations. Past and present actions would contribute an overall long-term minor beneficial component to these actions. There are no foreseeable actions that would contribute to cumulative impacts on monument operations.

Conclusion. Implementation of the no-action alternative would have a long-term, moderate to major, beneficial impact on monument operations. Other actions in the region would contribute a long-term minor beneficial cumulative effect.

OTHER IMPACTS

UNAVOIDABLE MAJOR ADVERSE IMPACTS

Although there would be a slight increase in the cumulative size of disturbed areas when facilities are constructed at some outlying units under the preferred alternative, this would result in minor adverse impacts on natural resources. There are no actions in either of the alternatives that would result in unavoidable major adverse impacts on natural resources, cultural resources, or visitor enjoyment.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Implementing the preferred alternative would result in the irretrievable loss of approximately 3 acres of soil productivity, vegetation, and wildlife habitat, due to construction of facilities. There would be no loss of cultural resources.

RELATIONSHIPS BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Under the preferred alternative, the majority of the monument would be in the Four Corners Exploration zone, which allows only minimal, unobtrusive development. The National Park Service would manage this zone to maintain natural ecological processes and native biological communities. Measures would be taken on any actions the monument would take to ensure that human uses do not adversely affect the productivity of natural biotic communities.

The no action alternative would not result in any new development and, thus, would have no potential for a reduction in long-term productivity. Under the preferred alternative, there would be a slight increase in the disturbance footprint as new facilities (maintenance facilities, parking areas, toilets) are constructed. However, when viewed in the regional context, this small amount of disturbance would not result in more than a negligible loss of long-term productivity of the land.

CONSULTATION AND
COORDINATION

5



PUBLIC AND AGENCY INVOLVEMENT

This general management plan / environmental assessment for Hovenweep National Monument represents the thoughts and ideas of the National Park Service, the national monument staff, visitors, and the public. Consultation and coordination among the agencies and the public were vitally important throughout the planning process. There were three primary avenues by which the public participated during the development of the plan—participation in public meetings, responding to newsletters, and providing comments on the national monument’s website.

PUBLIC MEETINGS AND NEWSLETTERS

Public meetings and newsletters were used to keep the public informed and involved in the planning process for Hovenweep National Monument. A mailing list was compiled that consisted of members of government agencies, organizations, businesses, legislators, local governments, and interested citizens.

A notice of intent to prepare an environmental impact statement was published in the *Federal Register* on January 16, 2003. At a briefing on the general management plan, the NPS Intermountain regional director determined that due to the limited scope of the actions proposed in the general management plan, the limited potential for significant impacts, and the lack of political controversy, an environmental impacts study would not be required for this plan. A notice of termination of the environmental impact statement (and preparation of an environmental assessment instead) was published in the *Federal Register* on July 26, 2006.

The first newsletter, issued in March 2003, described the planning effort. Public meetings conducted in November 2003 in Monticello, Utah, Blanding, Utah, and Cortez, Colorado, were attended by a total of 20 people.

Comments were received at the meetings, and in response to the first newsletter. These comments were considered and incorporated into the issues for the plan.

A second newsletter distributed in October 2004 described the draft alternative concepts for managing the national monument.

Throughout the process, park staff and the planning team have consulted with federal and state elected representatives; federal and state agencies, including the National Park Service, the Bureau of Land Management, and the Colorado and Utah state historic preservation offices; the Navajo Tribal Historic Preservation Officer; Montezuma County, Colorado; and San Juan County, Utah.

SECTION 7 CONSULTATION (ENDANGERED SPECIES ACT)

To comply with section 7 of the Endangered Species Act, the National Park Service coordinated informally with the U.S. Fish and Wildlife Service, U.S. Department of the Interior. The list of threatened and endangered species (see appendix C) was compiled with the use of lists and information received from the U.S. Fish and Wildlife Service.

In accordance with the Endangered Species Act and relevant regulations in 50 CFR 402, the National Park Service determined that this general management plan would not be likely to cause adverse effects on any federally listed threatened or endangered species. The National Park Service sent a copy of this plan to the U.S. Fish and Wildlife Service with a request for written concurrence with that determination.

In addition, the National Park Service has committed to consult about future actions

conducted under the framework described in this plan to ensure that such actions will not be likely to adversely affect threatened or endangered species.

NATIVE AMERICAN CONSULTATION

As part of the general management planning process, the monument sent letters to different American Indian groups, including the Navajo tribal preservation office, inviting them to participate in the process. A total of 32 pueblos and tribes were consulted about the planning process and invited to participate in consultation meetings. Consultation meetings were held in Albuquerque, New Mexico; and Cortez, Colorado. The Acoma, Laguna, and Sandia Pueblos participated in consultation meetings in Albuquerque. The tribal representatives at the meeting in Albuquerque expressed support for continued archeological research at the Hovenweep units. The Hopi Tribe submitted written comments in response to the invitation to the meeting in Cortez.

SECTION 106 CONSULTATIONS

Agencies that have direct or indirect jurisdiction over historic properties are required by section 106 of the National Historic Preservation Act of 1966, as amended (16 USC 270, et seq.) to take into account the effect of any undertaking on properties eligible for listing in the National Register of Historic Places. To meet the requirements of 36 CFR 800, the National Park Service sent letters to the Colorado and Utah historic preservation offices, the Navajo Tribal Historic Preservation Officer, and the Advisory Council on Historic Preservation, inviting their participation in the planning process. Copies of all the newsletters were sent to these offices with a request for comments.

APPENDIXES, REFERENCES,
PREPARERS AND CONSULTANTS

6



**APPENDIX A: COOPERATIVE AGREEMENTS FOR
HOVENWEEP NATIONAL MONUMENT
AND THE SOUTHEAST UTAH GROUP**

Organization	Project	Expiration Date
Cooperative Agreements		
Hopi Foundation	Cultural Projects	2013
Crow Canyon Archaeological Center	Archaeological Research of Goodman Point	2010
Forest Service, BLM, NPS, San Juan County, Cooperating Assoc, City of Monticello	Management of Monticello Interagency Visitor Center	2009
San Juan County	Management of Emergency Operations	2011
Southwest Conservation Corps	Conservation Projects	2011
Four Corners School of Outdoor Education	Conservation Projects	2013
American Conservation Experience	Conservation Projects	2009
Forest Service, BLM, NPS, Grand County, Cooperating Assoc, City of Moab	Management of Moab Interagency Visitor Center	2013
Interagency Agreements		
BLM - Anasazi Heritage Center	Curatorial Storage and Services of HOVE	2011
Colorado BLM	Shared Law Enforcement	2011
Monticello, Utah BLM	Shared Law Enforcement	2010
General Agreements		
Utah State Parks, Edge of Cedars Museum	Office Space for Vanishing Treasures Position	2012
San Juan County	Outdoor Education Program	2011
Grand and San Juan Counties	Elimination of Nonnative Invasive Species	2011

APPENDIX B: LIST OF CLASSIFIED STRUCTURES

Number	Name	State	Significance Level
HOVE 01	Hovenweep House	Utah	Contributing
HOVE 02	Square Tower	Utah	Contributing
HOVE 03	Pueblo	Utah	Contributing
HOVE 04A	Hovenweep Castle	Utah	Contributing
HOVE 04B	Hovenweep Castle	Utah	Contributing
HOVE 04C	Hovenweep Castle	Utah	Contributing
HOVE 04D	Hovenweep Castle	Utah	Contributing
HOVE 04E	Talus Pueblo	Utah	Contributing
HOVE 05	Alcove Room	Utah	Contributing
HOVE 06	Storage Room	Utah	Contributing
HOVE 07	Alcove Rooms	Utah	Contributing
HOVE 08	Tower Point	Utah	Contributing
HOVE 11	Unit House	Utah	Contributing
HOVE 12A	Twin Towers	Utah	Contributing
HOVE 12B	Eroded Boulder House	Utah	Contributing
HOVE 12C	Round Tower	Utah	Contributing
HOVE 12D	Rimrock House	Utah	Contributing
HOVE 13	Stone Walls	Utah	Contributing
HOVE 14	Stronghold House	Utah	Contributing
HOVE 15	Pueblo	Utah	Contributing
HOVE 17	Boulder Room	Utah	Contributing
HOVE 18	Boulder Room	Utah	Contributing
HOVE 19	Boulder Rooms	Utah	Contributing
HOVE 21	Storage Rooms	Utah	Contributing
HOVE 51A	Cajon Castle	Utah	Contributing
HOVE 51B	Cajon House	Utah	Contributing

Appendix B: List of Classified Structures

Number	Name	State	Significance Level
HOVE 51C	Cajon Tower	Utah	Contributing
HOVE 51D	Room 13	Utah	Contributing
HOVE 52E	Southeastern Pueblo Complex	Utah	Contributing
HOVE 52F	Spring	Utah	Contributing
HOVE 53A	Holly House	Colorado	Contributing
HOVE 53B	Round Corner Tower	Colorado	Contributing
HOVE 54C	Holly Tower	Colorado	Contributing
HOVE 55D	Pueblo	Colorado	Contributing
HOVE 55E	Tilted Boulder House	Colorado	Contributing
HOVE 55F	Ruin on Top of Boulder	Colorado	Contributing
HOVE 57	Horseshoe House	Colorado	Contributing
HOVE 58	Horseshoe Kiva	Colorado	Contributing
HOVE 61	Horseshoe Tower	Colorado	Contributing
HOVE 64A	Hackberry Circular Structure	Colorado	Contributing
HOVE 64B	Hackberry Small Structure	Colorado	Contributing
HOVE 66	Hackberry Pueblo	Colorado	Contributing
HOVE 67A	Circular Roomblock	Colorado	Contributing
HOVE 67B	Small Structure	Colorado	Contributing
HOVE 68	Hackberry Cave	Colorado	Contributing
HOVE 70	Cutthroat Castle	Colorado	Contributing
HOVE 70	Rooms 9 and 10	Colorado	Contributing
HOVE 70	Tower D	Colorado	Contributing
HOVE 70	Tower E and Room 8	Colorado	Contributing
HOVE 70	Room 13	Colorado	Contributing
HOVE 70	Structure 2	Colorado	Contributing

APPENDIX C: CONSULTATION LETTERS



IN REPLY REFER TO:
ES/CO:NPS
MS 65412 GJ

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
764 Horizon Drive, Building B
Grand Junction, Colorado 81506-3946

Received

MAR 06 2003

DSC-PSD

March 3, 2003

Memorandum

To: Natural Resource Specialist, National Park Service, Denver Service Center,
Denver, Colorado (Attn: Matthew Safford)

From:  Assistant Field Supervisor, Fish and Wildlife Service, Ecological Services, Grand
Junction, Colorado 

Subject: Species List for Hovenweep National Monument General Management Plan in
Montezuma County, Colorado

We have received your January 29, 2003, correspondence requesting a list of federally listed threatened (FT), endangered (FE), and candidate (FC) species that may occur within Hovenweep National Monument in Montezuma County, Colorado. Although Federal candidates do not receive protection under the Endangered Species Act, the Service appreciates any considerations that are taken to minimize impacts to these species. The Gunnison sage-grouse (*Centrocercus minimus*) is considered by the Service a high priority species for conservation efforts. Potential impacts to this species should be scrutinized and in accordance with recovery efforts. If you are unaware of how the Hovenweep General Management Plan may impact this species, please contact the Service or the Colorado Division of Wildlife for assistance.

You will also find a "species of concern" that is not a federally listed or candidate species, but should be considered when developing your Plan. "Species of concern" may have limited range within Colorado or have been noted to be on the decline. Any water depletions that may occur while implementing your Plan will require consultation for the endangered Colorado River fishes. The National Park Service should also consider its responsibility to the Migratory Bird Treaty Act.

Federally Listed Species for Hovenweep National Park

Bald eagle (FT)	<i>Haliaeetus leucocephalus</i>
Southwestern willow flycatcher (FE)	<i>Empidonax traillii extimus</i>
Yellow-billed cuckoo (FC)	<i>Coccyzus americanus</i>
Mexican spotted owl (FT)	<i>Strix occidentalis lucida</i>
Gunnison sage-grouse (FC)	<i>Centrocercus minimus</i>
<i>Astragalus humillimus</i> (FE)	Mancos milk-vetch
<i>Sclerocactus mesae-verdae</i> (FT)	Mesa Verde cactus

United States Department of the Interior
NATIONAL PARK SERVICE
Southeast Utah Group
Arches and Canyonlands National Parks
Hovenweep and Natural Bridges National Monuments
2282 S. West Resource Boulevard
Moab, Utah 84532-3298

D18 (DSC-P)
HOVE

Ms. Georgianna Contiguglia, SHPO
Colorado Historical Society
1300 Broadway
Denver, CO 80203

Re: General Management Plan, Hovenweep National Monument

Dear Ms. Contiguglia:

The National Park Service (NPS) is in the process of preparing a general management plan (GMP) and accompanying environmental assessment (EA) for Hovenweep National Monument, Cortez, Colorado. The GMP will provide National Park Service managers a comprehensive planning framework for managing the park over the next fifteen to twenty years. Consistent with the park's purpose, significance, and legislative mandates, the plan is identifying strategies for reaching desired resource conditions, visitor experiences, and the appropriate types of and locations for potential future development. The combined GMP/EA will identify management issues and concerns, will present a reasonable range of management alternatives for addressing these issues, and will assess the impacts of each alternative on natural and cultural resources and other impact topics. The National Park Service requests your involvement. We are therefore taking this opportunity to initiate consultation with you in accordance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, and with the National Environmental Policy Act of 1969 (NEPA).

We invite you to meet with us at your convenience to discuss these planning issues. If you would like to arrange a meeting, please call me at (970) 562-4282 or e-mail me at corky_hays@nps.gov or write to me at the address above. I welcome your comments and would appreciate an opportunity to brief you on the development of the draft plan.

We will keep you informed of public meetings on the draft GMP/EA. At the appropriate time we shall invite you to review and comment upon the draft plan.

Thank you in advance for your consideration. If you have any questions or require additional information, please contact me as mentioned above.

Sincerely,

/s/

Coralee S. Hays
Park Superintendent
Hovenweep National Monument

cc: Mr. John M. Fowler, Executive Director, Advisory Council on Historic Preservation
Mr. Wilson Martin, SHPO Utah State Historical Society



United States Department of the Interior
NATIONAL PARK SERVICE
Southeast Utah Group
Arches and Canyonlands National Parks
Hovenweep and Natural Bridges National Monuments
2282 S. West Resource Boulevard
Moab, Utah 84532-3298

IN REPLY REFER TO:
D18 (DSC-1)
HOVE

Mr. Wilson Martin, SHPO
Utah State Historical Society
Utah State Historic Preservation Office
300 Rio Grande St.
Salt Lake City, UT 84101

Re: General Management Plan, Hovenweep National Monument

Dear Mr. Martin:

The National Park Service (NPS) is in the process of preparing a general management plan (GMP) and accompanying environmental assessment (EA) for Hovenweep National Monument, Cortez, Colorado. The GMP will provide National Park Service managers a comprehensive planning framework for managing the park over the next fifteen to twenty years. Consistent with the park's purpose, significance, and legislative mandates, the plan is identifying strategies for reaching desired resource conditions, visitor experiences, and the appropriate types of and locations for potential future development. The combined GMP/EA will identify management issues and concerns, will present a reasonable range of management alternatives for addressing these issues, and will assess the impacts of each alternative on natural and cultural resources and other impact topics. The National Park Service requests your involvement. We are therefore taking this opportunity to initiate consultation with you in accordance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, and with the National Environmental Policy Act of 1969 (NEPA).

We invite you to meet with us at your convenience to discuss these planning issues. If you would like to arrange a meeting, please call me at (970) 562-4282 or e-mail me at corky_hays@nps.gov or write to me at the address above. I welcome your comments and would appreciate an opportunity to brief you on the development of the draft plan.

We will keep you informed of public meetings on the draft GMP/EA. At the appropriate time we shall invite you to review and comment upon the draft plan.

Thank you in advance for your consideration. If you have any questions or require additional information, please contact me as mentioned above.

Sincerely,

/s/

Coralee S. Hays
Park Superintendent
Hovenweep National Monument

cc: Mr. John M. Fowler, Executive Director, Advisory Council on Historic Preservation
Ms. Georgianna Contiguglia, SHPO Colorado Historical Society



Department of Community and Culture

State History
160 East 200 South
Salt Lake City, UT 84143

June 30, 2008

Corky Day
Park Superintendent
Hovenweep National Monument
3287 South West Resource Boulevard
Moab, Utah 84542-3248

RE: General Management Plan, Hovenweep National Monument

In reply, please refer to Case No. 07-2260.

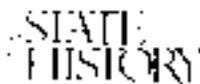
Dear Ms. Day:

The Utah State Historic Preservation Office has received the above plan. We have had ample time to examine the plan, and we have had numerous conversations with the National Park Service over the plan's relationship to cultural resources.

We appreciate the city's given to one of Utah's most important cultural resources in your general management approach and in this plan itself. We have no concerns with the plan, but we are always available for further discussions if desired.

If you have questions, please don't hesitate to contact our office.

Matthew J. Sedore, Ph.D.
Director, State Historic Preservation Office - Archaeology



Utah State Historic Preservation Office
160 East 200 South
Salt Lake City, Utah 84143
Phone: 313.246.3000
Fax: 313.246.3001
www.ushpo.org



 OFFICE OF ARCHAEOLOGY AND HISTORIC PRESERVATION

June 9, 2008

Tom Thomas
National Park Service
Denver Service Center #108
P. O. Box 25287
Denver, Colorado 80225

RE: Hovenweep National Monument General Management Plan
CHS # 51287

Dear Mr. Thomas:

The Office of Archaeology and Historic Preservation staff thanks you, Ceryk Hays, and Chris Goetze for meeting with us on May 13, 2008. Your presentation and the subsequent discussion were helpful in understanding the approach you are taking with the general management plan.

We are impressed with the plan's emphasis on cultural landscapes, viewsheds and cumulative impacts. Additionally we appreciate your intentions to engage in tribal and local government consultation at the earliest stages of planning. A successful management plan will necessarily satisfy both groups.

There was some discussion that the titles given to some of the interpretative themes for the various management zones may not be descriptive, so we urge you to take another look at those. For example, the "Four Corners" and "Canyon and Mesa" zones seem counter-intuitive and perhaps should be switched. Additionally we urge consideration of more specific plans for how the various zones will be managed. For example, regarding the Goodman Point unit, the plan addresses increased access by the local population by placing the majority of the unit in a "Sensitive Resources" zone but does not describe what this means in terms of management for that particular unit.

During our meeting there was some indication that a second management classification system may be used by the National Park Service, perhaps dealing with fire classes. We believe this bears some discussion, if not integration, into the plan that is being shared for comment.

We believe that Alternative B, the preferred alternative, best protects the national monument's historic properties.

www.nps.gov/ohp/officeofarchaeologyandhistoricpreservation

1000 14th Street, NW, Suite 1200, Washington, DC 20005 | Phone: 202-725-1300 | Fax: 202-725-1301 | Email: ohp@nps.gov

APPENDIX D: DETERMINATION OF IMPAIRMENT

A determination of impairment is made for each of the resource impact topics carried forward and analyzed in the environmental impact statement for the preferred alternative. The description of monument significance in chapter 1 was used as a basis for determining if a resource is

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the monument, or
- key to the natural or cultural integrity of the monument or to opportunities for enjoyment of the monument, or
- identified in the monument's general management plan or other relevant NPS planning documents as being of significance.

Impairment findings are not necessary for visitor experience, socioeconomics, environmental justice, land use, and monument operations, etc., because impairment findings relate to monument resources. These impact topics are not generally considered to be monument resources according to the Organic Act, and cannot be impaired the same way that an action could impair monument resources.

PREHISTORIC STRUCTURES AND ARCHEOLOGICAL RESOURCES

The Hovenweep structures are the best preserved and protected and most visually striking and accessible examples of 13th century pueblo architecture and community locations within the San Juan River basin. The Goodman Point unit was the first archeological site set aside by the federal government in 1889 and is one of the largest 13th century ancestral Pueblo villages in the San Juan River basin. The monument also contains examples of ancient astronomical calendars that mark important seasonal events using architecture, rock art, and sunlight.

Archeological resources have been identified as a fundamental resource in the general management plan and, therefore, are necessary to fulfill the purposes for which the monument was established, and are key to the cultural integrity of the monument. Under the preferred alternative, impacts on aboveground prehistoric structures, walls, check dams, and trails could result from trampling, unauthorized visitor access to cultural sites, vandalism, and theft. Inadvertent adverse impacts include knocking top course stones loose by walking on or leaning against ruin walls and creating social trails that contribute to erosion and the destabilization of original architecture. Intentional vandalism could include inscribing graffiti, dismantling stones in walls, and probing or digging in ruin walls. Archeological resources adjacent to or easily accessible from visitor use areas or trails would continue to be vulnerable to inadvertent damage and vandalism.

The actions under this alternative would result in negligible to minor, long-term, adverse impacts on prehistoric structures and to archeological resources. Because there would be no major adverse impacts to archeological resources, the preferred alternative would not result in impairment.

CULTURAL LANDSCAPES

Cultural landscapes include elements of the built environment—for example, kivas, towers, check dams, irrigation ditches, food growing areas, and roads—in a larger context that conveys the story of human habitation in the area. The ways in which these people located their settlements in relationship to the natural environment and to other settlements can inform modern visitors about the conditions the people of these cultures faced and the ways they functioned in their environment. The cultural landscapes at Hovenweep exhibit the characteristics of ethnographic landscapes, which are defined as landscapes containing a variety of natural and

cultural resources that associated people define as heritage resources and that have significance to their way of life. Cultural landscapes have been identified as a fundamental resource in the general management plan and, therefore, are necessary to fulfill the purposes for which the monument was established, and are key to the cultural value of the monument.

Careful design would ensure that the construction of the maintenance facility and additional office space at the Square Tower unit would minimally affect the scale and visual relationships among landscape features. The topography, patterns of native vegetation, circulation features, and land use patterns of the landscape would remain largely unaltered by such actions, resulting in long-term, negligible to minor, adverse effects.

Visitation could impact archeological sites and prehistoric structures, important components of the monument's cultural landscapes. Archeological sites and prehistoric structures adjacent to or easily accessible from visitor use areas or trails would continue to be vulnerable to inadvertent damage and vandalism. Potential impacts related to visitation under this alternative would result in negligible to minor, long-term or permanent, adverse impacts on cultural landscapes.

Because there would be no moderate or major adverse impacts to archeological resources, the preferred alternative would not result in impairment.

VEGETATION

Four of Hovenweep's six units are on Cajon Mesa in the juniper/sage and sagebrush areas in the central portion of the mesa. In addition to juniper trees and sagebrush, there are rabbitbrush, cliffrose, Mormon tea, yucca, serviceberry, and various cacti. Additional tree species such as cottonwood, willow, and hackberry are found in the moister canyon bottoms. South of the Square Tower unit, the sagebrush gradually changes into a mixed shrubland vegetation zone composed of

shadscale, greasewood, snakeweed, and grasses. In overgrazed and disturbed areas outside the monument, snakeweed has become the dominant plant. This mixed shrubland vegetation zone covers the southern end of Cajon Mesa and the San Juan River valley. Cajon is the only unit of Hovenweep in this vegetation zone.

Native plant and animal species have been identified as a fundamental resource in the general management plan and, therefore, are necessary to fulfill the purposes for which the monument was established, and are key to the natural setting of the monument.

Some adverse impacts on vegetation would be expected as a result of implementing the preferred alternative. Construction of a maintenance facility in the Square Tower unit would impact about 2 acres. There would be slight changes to existing development footprints in outlying units (such as clearing parking areas or replacing pit toilets with vault toilets) that would affect vegetation under this alternative. This construction would disturb or destroy a total of about 3 acres (or 0.4% of the monument) of vegetation, resulting in long-term, minor, adverse impacts. Based on this impact analysis, there would be no adverse impacts to these resources that would result in impairment.

WILDLIFE

The wildlife species seen at Hovenweep are typical of a Colorado Plateau ecosystem. Most of the mammals in the area are wide-ranging species. Common species include desert cottontail, black-tailed jackrabbit, deer mouse, badger, ringtail, skunk, porcupine, coyote, kit fox, bobcat, mountain lion, and mule deer. Other species with specialized habitats such as rock ledges or crevices include bats, rock squirrels, mice, and wood rats (packrats). Bats, mice, wood rats, insects, and arachnids will also occasionally inhabit the ruins. Various neotropical songbirds, raptors, and owls reside in and around the area. The monument's bird list indicates that 83 species have been sighted (NPS Southeast Utah

Group Resource Management 2004). Monument staff has seen a salamander (*Ambystoma tigrinum*) in the seep pool at Cajon. Reptiles include collared, sage brush, and western fence lizards and various snakes.

Native plant and animal species have been identified as a fundamental resource in the general management plan and, therefore, are necessary to fulfill the purposes for which the monument was established, and are key to the natural setting of the monument.

Implementing the preferred alternative would result in a slight increase in the amount of disturbed area in the monument from the construction of a new maintenance facility in the Square Tower unit and other minor construction in the outlying units (totaling approximately 3 acres). This would result in a temporary and highly localized increase in noise and human activity that could cause displacement of individuals—a short-term, minor, adverse impact. The changes to existing facilities would occur in or near disturbed areas that do not provide quality habitat and would have a long-term, negligible, adverse impact on wildlife. Based on this impact analysis, there would be no adverse impacts to these resources that would result in impairment.

VIEWSHEDS

Maintaining the natural views is essential to preserving the character of both the central Mesa Verde and surrounding regions. Unobstructed natural views are important because they contribute to feelings of remoteness, solitude, and a sense of timelessness—fundamental qualities of the Hovenweep experience. As expressed through a recent visitor survey and comments received during scoping for this document, visitors to the monument desire and seek out these qualities. Natural views are important at all of the monument's units, but the planning team identified two critical vistas. Because the monument's units are so small, most of the viewsheds are outside the park boundary. The

first critical viewshed is from the back of the visitor center at Square Tower unit, looking due south to due east. The second critical viewshed is from the trailhead at the Goodman Point unit. From here one can see more than 180 degrees—from the west through south and to the east.

Views and vistas from within the park boundary have been identified as fundamental resources in the general management plan and are important to fulfill the purposes for which the monument was established.

Implementing the preferred alternative would involve construction of a new maintenance facility in the Square Tower unit. The structure would be carefully placed and other mitigative measures would be applied. The resulting impact of this structure would be long term, minor, and adverse. There would be no effect on the Goodman Point viewshed. Based on this impact analysis, there would be no adverse impacts to these resources that would result in impairment.

SOUNDSCAPES

At Hovenweep, natural sounds predominate throughout the remote units and, therefore, throughout the majority of the monument. Other than aircraft noise, human-caused sounds are usually confined to developed areas, such as at Square Tower, and to areas near major roads. Visitor use produces intermittent noises, such as vehicle engines, doors closing, and voices. The level of noise varies by location and time of year, relative to the number of visitors. These sound levels also fluctuate with the general topography of the area and with variations in weather conditions, including temperature, wind, and humidity. Ambient noise levels are impacted by sources outside the monument boundaries, such as machinery associated with gas well production and ranching operations.

Natural soundscapes have been identified as fundamental resources in the general management plan and are important to fulfill

the purposes for which the monument was established.

The level of human-related noise would increase slightly at the Square Tower, because visitation is anticipated to increase at this unit under the preferred alternative. The sources of noise would be the same as those existing (vehicles starting and stopping, car doors, voices), but more people would increase the intensity, or decibel level, during busy periods. The impact to natural soundscapes would be long-term, negligible, and adverse. The minor construction called for in this alternative would cause short-term, minor to moderate, adverse impacts on localized soundscapes. These impacts would cease once construction was completed. Based on this impact analysis, there would be no adverse impacts to these resources that would result in impairment.

NIGHT SKIES

The rural setting of the monument currently provides for relatively dark nights. Even minor elements of artificial lighting within park boundaries could affect the pristine quality of regional night skies. Night skies have been identified as a fundamental resource in the general management plan and

are important to fulfill the purposes for which the monument was established.

Implementing the preferred alternative would involve construction of a new maintenance facility in the Square Tower unit. Required lighting to meet health, safety, and security guidelines for the facility and parking area could pose adverse impacts on views of the night sky from the Square Tower unit. Careful design and placement of lighting would minimize the impacts of lighting on the night sky. The resulting impact of this structure would be long term, negligible to minor, and adverse.

SUMMARY

Based on the analysis above, there would be no moderate or major adverse impacts to a resource or value (1) whose conservation is necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park, (2) is key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or (3) is identified in the park's general management plan or other relevant NPS planning documents as being of significance. Therefore, implementing the preferred alternative would not result in impairment.

REFERENCES

Ambrose, Skip, and Chris Florian

- 2008 "Acoustic Measurements in Arches National Park, Canyonlands National Park, Hovenweep National Monument, and Natural Bridges National Monument, 2000–2007" (draft). Castle Valley, Utah: Sandhill Company for the National Park Service.

Bailey, G.A., and R.A. Bailey

- 1978 "An Ethnohistoric Study of a Portion of the Eastern Off-Reservation Navajo Area." Report 184. Cultural Resource Management Division, New Mexico State University, Las Cruces.

Brew, John Otis

- 1946 "Archaeology of Alkali Ridge, Southeast Utah." Papers of the Peabody Museum of Archaeology and Ethnography 21. Cambridge.

Colorado Division of Wildlife (CDOW)

- 2003 Species Conservation Web page (<http://wildlife.state.co.us>). Accessed in June and September 2003. Denver, Colorado.

Cummings, Byron

- 1915 "The kivas of the San Juan Drainage." *American Anthropologist* 17(2). Washington.

Delost, Jeremy, and Martha E. Lee

- 2000 "Hovenweep National Monument Visitor Study, Final Report." Flagstaff, Arizona: Northern Arizona University School of Forestry.

Eddy, Frank W., Allen E. Kane, and Paul R. Nickens

- 1984 "Southwest Colorado Prehistoric Context." Office of Archaeology and Historic Preservation. Denver.

Fewkes, Jesse Walter

- 1918 "Prehistoric Ruins of Southwestern Colorado and Southeastern Utah." Smithsonian Miscellaneous Collections, 68(12): 108-133.
- 1919 "Prehistoric Villages, Castles and Towers of Southwestern Colorado." *Bureau of American Ethnology, Bulletin* 70.
- 1923 Archeological Field-Work on the Mesa Verde National Park. Smithsonian Miscellaneous Collections; Explorations and Field-Work for 1922. Vol. 74, No. 15. Washington.
- 1925 "The Hovenweep National Monument." Bureau of American Ethnology, Annual Report 1923:465-480. Washington, D. C.

Fiero, Kathleen

- 2002 Stabilization of Square Tower, 1990-2002, Ms. on file Southeast Utah Group Headquarters, Moab, UT.

Geib, P.R., H.C. Fairley, and J.R. Ambler

- 1986 Archeological Research Plan for the Glen Canyon National Recreation Area. Archeological Report 998. Northern Arizona University, Flagstaff.

Grahame, John D., and Thomas D. Sisk, eds.

- 2002 "Canyons, Cultures and Environmental Change: An Introduction to the Land-Use History of the Colorado Plateau" (at www.cpluhna.nau.edu). Flagstaff, Arizona: Northern Arizona University.

Greubel, R.A.

- 1991 "Hovenweep Resource Protection Zone Class III Cultural Resource Inventory, Montezuma County, Colorado, and San Juan County, Utah." Prepared for and funded by the Bureau of Land Management, Colorado, Bureau of Land Management, Utah, National Park Service, Rocky Mountain Region. Alpine Archaeological consultants, Inc., Alan D. Reed, Principal Investigator, Montrose, Colorado.

Holmes, W.H.

- 1878 Report on the Ancient Ruins of Southwestern Colorado, Examined During the Summers of 1875 and 1876. United States Geological and Geographical Survey of the Territories. Tenth Annual Report. Washington.

Hunt, Alice P. and Dallas Tanner

- 1960 "Early Man Sites near Moab, Utah." *American Antiquity* 26(1):111-113.

Huntington, W.D.

- 1854 "Discovery of Prehistoric Ruins in Colorado, 1854." In *Deseret News*, Salt Lake City, Utah.

Irwin-Williams, Cynthia

- 1973 *The Oshara Tradition: Origins of Anasazi Culture*. Eastern New Mexico University.
- 1979 "Post-Pleistocene Archeology, 7000-2000 B.C." In *Southwest*, edited by Alfonso Ortiz, pp. 31-42. Handbook of North American Indians, Vol. 9, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Jackson, William H.

- 1878 "Ancient Ruins in Southwestern Colorado." United States Geological and Geographical Survey of the Territories for 1874. Eighth Annual Report. Washington, D.C.

Jennings, Jesse D.

- 1978 *Prehistory of Utah and the Eastern Great Basin*. University of Utah Press, Salt Lake City, UT.

Judge, W. James

- 1982 "The Paleo-Indian and Basketmaker Periods: An Overview and Some Research Problems." *In The San Juan Tomorrow: Planning for the Conservation of Cultural Resources in the San Juan Basin*, F. Plog and W. Wait, eds., pp. 5-58. Santa Fe: National Park Service.

Kidder, Alfred V.

- 1910 "Explorations in Southeastern Utah in 1908." *American Journal of Archaeology* 14(3). NY.

Lipe, William D.

- 1993 "The Basketmaker II Period in the Four Corners Area." *In Anasazi Basketmaker: Papers from the Wetherill-Grand Gulch Symposium*, edited by V.M. Atkins, pp. 1-10. Cultural Resource Series No. 24. Bureau of Land Management, Salt Lake City, UT.

Mayberry, Jim, and Larry Nordby

- 1998 "Hovenweep Visitors' Center Footprint Survey Hovenweep National Monument: Square Tower Unit." Draft Ms. on file Mesa Verde National Park, division of Research and Resource Management, Mesa Verde, Colorado.

Morley, S.G., and A.V. Kidder

- 1917 "The Archaeology of McElmo Canyon, Colorado." *El Palacio* 4:41-70.

Morley, Sylvanus G.

- 1908 "The excavation of the Cannonball Ruins in Southwest Colorado." *American Anthropologist* 10: 596-610.

National Park Service, Department of the Interior (NPS)

- 1985 "Environmental Assessment for the General Management Plan and Development Concept Plan, Hovenweep National Monument." Denver, Colorado: Rocky Mountain Region.
- 1986 "Draft Hovenweep National Monument General Management Plan and Development Concept Plan." Denver, Colorado: Rocky Mountain Region.
- 1993 "Guiding Principles of Sustainable Design."
- 1998 NPS-28: *Cultural Resource Management*.
- 2000 "Baseline Water Quality Data Inventory and Analysis, Hovenweep National Monument." Technical Report NPS/NRWRD/NRTR-99/251. Fort Collins, Colorado: NPS Water Resources Division.
- 2001 NPS-12: *Natural Resource Management*.

Appendixes, References, Preparers and Consultants

- 2004 "Money Generation Model." Washington, D.C.: NPS Public Use Statistics Office.
- 2006 "An Archeological Survey of Hovenweep National Monument's Square Tower Unit, Phase One: The Upland Portion." Manuscript on File, Southeast Utah Group, Moab, UT.
- 2006 *NPS Management Policies 2006*. Washington, D.C.

Natural Resources Conservation Service (NRCS)

- 1997 "Introduction to Microbiotic Crusts." U.S. Department of Agriculture, Natural Resources Conservation Service.

Nickens, P.R.

- 1982 "A Summary of the Prehistory of southeastern Utah." In *Contributions to the Prehistory of Southeastern Utah*, assembled by S.G. Baker. Cultural Resources Series 13. Bureau of Land Management, Utah State Office, Salt Lake City.

Nickens, P.R., and D.A. Hull

- 1982 "Archaeological Resources of Southwestern Colorado: An Overview of the Bureau of Land Management's San Juan Resource Area." In *Archaeological Resources in Southwestern Colorado*, edited by S. Eininger, et al., pp. 1-307. Colorado State Office, Bureau of Land Management Cultural Resource Series 13, Denver, CO.

Nordby, Larry V., and C. David Johnson

- 2005 "Hovenweep's Square Tower Ruin: How Efforts to Preserve the Known Exposed the Unknown." Ms. on file Mesa Verde National Park, Mesa Verde, Colorado.

Prudden, T. Mitchell

- 1903 "Prehistoric Ruins of the San Juan Watershed in Utah, Arizona, Colorado, and New Mexico." *American Anthropologist* 5 (2). Lancaster.
- 1914 "The Circular Kivas of Small Ruins in the San Juan Watershed." *American Anthropologist* n.s. 16:33-58.
- 1918 "A Further Study of Prehistoric Small House Ruins in the San Juan Watershed." *Memoirs of the American Anthropological Association*, Vol 5, No. 1.

Riley, Carroll L.

- 1948 "An Archeological Survey at Hovenweep National Monument." Ms. on file at Mesa Verde National Park, Mesa Verde, Colorado.

San Jose State University

- 1974 "Hovenweep 1974." San Jose, California: San Jose State University.

Shroeder, Albert H.

- 1963 "An Archeological Survey Adjacent to Hovenweep National Monument." Ms. on file at Mesa Verde National Park, Mesa Verde, Colorado.

Tipps, Betsy L., and N.J. Hewitt

- 1989 "Cultural Resource Inventory and Testing in the Salt Creek Pocket and Devils Lane Areas, Needles District, Canyonlands National Park, Utah." Selections from the Division of Cultural Resources, No. 1, Rocky Mountain Region, National Park Service, Denver.

U.S. Census Bureau

- 2001 "2001 County Business Patterns for Montezuma, CO; 2001 County Business Patterns for San Juan, Utah." Accessed at www.census.gov.
- 2003 "State and County Quick Facts." Accessed at www.census.gov.

U.S. Fish and Wildlife Service (USFWS)

- 2003 Memorandum: Species List for Hovenweep National Monument General Management Plan in Montezuma County, Colorado. Grand Junction, Colorado: Ecological Services.

Utah Division of Wildlife Resources

- 2003 Utah Conservation Data Center (at dwrcdc.nr.utah.gov/ucdc). Accessed in September 2003. State of Utah, Natural Resources.

Winter, Joseph C.

- 1975 "Hovenweep 1974 Archeological Report No. 1." Anthropology Department, San Jose State University, San Jose, CA.
- 1976 "Hovenweep 1975 Archeological Report No. 2". Anthropology Department, San Jose State University, San Jose, CA.
- 1977 "Hovenweep 1976 Archeological Report No. 3." Anthropology Department, San Jose State University, San Jose, CA.

Wosley, Anne I.

- 1978 "Hovenweep 1977 Preliminary Report." San Jose State University, San Jose, CA.

PREPARERS AND CONSULTANTS

PREPARERS

Tom Thomas, Project Manager, NPS Denver Service Center. Co-author of “Chapter 1: Introduction” and “Chapter 2: Alternatives, Including the Preferred Alternative.” Responsible for cultural resources and visitor use sections of affected environment, cultural resources, and visitor use impact analysis.

Matthew Safford, Natural Resource Specialist, NPS Denver Service Center. Co-author of “Chapter 1: Introduction” and “Chapter 2: Alternatives, Including the Preferred Alternative.” Responsible for natural resources and socioeconomics sections of affected environment, natural resources, and socioeconomics impact analysis.

Corky Hays, Superintendent, Hovenweep National Monument

Noreen Fritz, Archeologist, Hovenweep National Monument

Chris Nickel, Lead Ranger, Hovenweep National Monument

Todd Overbye, Lead Park Interpretation Ranger, Hovenweep National Monument

Larry Turk, Chief of Maintenance, Hovenweep National Monument

CONSULTANTS

Greg Cody, Technical Specialist for Cultural Resources, NPS Denver Service Center

Chris Goetze, Cultural Resource Program Manager, Southeast Utah Group

David Kreger, Technical Specialist for Natural Resources, NPS Denver Service Center

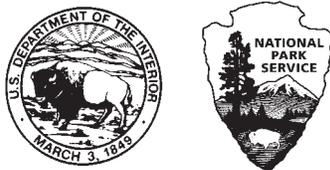
Charlie Schelz, Biologist, Canyonlands National Park

Jeff Troutman, Resource Management Division Chief, Canyonlands National Park, Southeast Utah Group

Dave Wood, Resource Management Planner, Canyonlands National Park

INDEX

- Affected Environment, 3, 89, 136
Anasazi Heritage Center, 22, 27, 44, 73, 143, 144
archeological resources, 23, 43, 55, 79, 99, 117, 122, 123, 126, 127
- boundary adjustments, 32, 33
Bureau of Land Management, iii, 19, 22, 24, 27, 28, 44, 73, 92, 93, 115, 122, 123, 151
- Canyons of the Ancients National Monument, 5, 19, 93, 100, 115, 143, 144
conservation archeology, 55, 56
Cultural Landscapes, 23, 85, 86, 98, 123
cultural resources, iii, 3, 7, 10, 14, 15, 23, 38, 39, 40, 42, 43, 56, 78, 79, 80, 82, 98, 106, 113, 114, 117, 118, 119, 127, 147, 166
Cutthroat, 56, 61, 69, 85, 92, 98, 99
- environmental consequences, 3, 23, 31
- Goodman Point, iii, 4, 23, 24, 25, 59, 60, 76, 77, 92, 93, 100, 102, 104, 114, 115, 130, 134, 137, 165, 167
- Hackberry, 56, 61, 67, 85, 92, 99, 102, 106,
Holly, 28, 56, 61, 67, 85, 92, 99, 106
Horseshoe, 56, 61, 67, 85, 92, 98, 99
- impact topics, 3, 23
- management zones, 3, 37, 38, 39, 44, 60
- National Environmental Policy Act, 3, 26, 78, 82, 113, 117
Night Sky, 13, 26, 85
NPS operations, 44, 61
- prehistoric structures, 21, 44, 56, 94, 119, 120, 121, 124, 125, 166
- socioeconomic environment, 3, 32, 113
Soundscapes, 13, 25, 85, 87, 104, 139
Special Status Species, 25, 86, 103, 134
Square Tower, 24, 27, 28, 59, 60, 63, 76, 92, 99, 102, 103, 104, 105, 106, 107, 108, 109, 114, 115, 123, 125, 129, 130, 132, 133, 137, 138, 139, 140, 141, 142, 166, 167, 168
- Vegetation, 13, 25, 79, 86, 101, 131
Viewsheds, 23, 85, 86, 103, 136
visitor center, 24, 38, 40, 75, 76, 79, 104, 106, 107, 108, 114, 129, 130, 131, 132, 137, 138, 139, 140, 141, 142, 167
visitor use, iii, 3, 4, 15, 20, 22, 25, 26, 27, 37, 38, 39, 41, 43, 74, 75, 87, 114, 120, 121, 122, 124, 125, 135, 137, 138, 140, 141, 142, 143, 165, 166



As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

NPS D41 August 2011



Printed on recycled paper



National Park Service
U.S. Department of the Interior

Hovenweep National Monument
Colorado • Utah

